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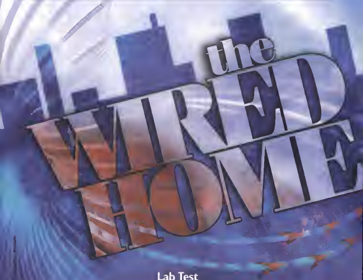

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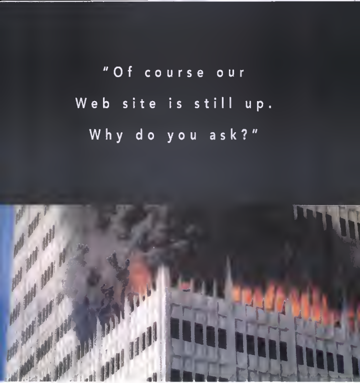

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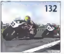

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Looking through a Big Blue crystal ball

IBM has an active and productive research and development team. In 1998 IBM became the first company to receive more than 2000 U.S. patents (2,658 to be exact) in a single year. It has held the top spot for most U.S. patents every year since 1993.

FROM THE EDITOR

Many of these patents are for technologies that will either be embedded into systems and be largely invisible to us, or which will take years to percolate into commercial products we'd be able to buy. Some are interesting for the potential they hold for the near future. For example one patent IBM was issued last year is for an organic light emitting diode (LED) technology.

Organic LEDs, according to IBM, have some interesting properties, such as their ability to be bent or stretched. They therefore have some potential application to products like large display systems you might see at an airport or in other public areas.

However, there are always some technologies within any company that are almost ready for prime time. So, when IBM sent out invitations to hear Peter Hortensius, its director of technology development, talk about some of the company's personal computing projects I jumped at the opportunity to attend.

Hortensius, who incidentally is a Canadian (born in Regina and with a PhD from the University of Manitoba), is also co-director of the Personal Systems Institute which is part of IBM's Personal Systems Group. It is within this group that raw technology meets commercial possibility.

"My responsibility, fundamentally, is making sure that what we're feeding into our products is appropriate from a technology perspective, i.e. it's ready to be deployed," says Hortensius. "Working out ahead of that, it's making sure those technologies are being made ready so that we can use them."

During the talk he discussed, and in some cases showed, mock-ups of several products at various stages of exploration. Among them.

The Roentgen display: This screen, which is based on an active-matrix LCD technology, gives 200 pixels per inch resolution, and contains more than five million color pixels. IBM says images and text viewed on such a display will be indistinguishable from those found on a printed page. As a basis for comparison, today's notebook computer screens contain approximately three-quarters of a million pixels. IBM has no product plans for the Roentgen display at this time, and Hortensius says there are issues—for example high power consumption—that still need to be addressed.

The Cyber Phone: This digital cellular phone incorporates a fold-out mirror display. With the phone held up to the ear in the talking position, the curved mirror reflects an image that, to the phone user, looks like a full size monitor image. Couple this with voice-recognition software, wireless Web and email access, and you begin to see where it might take you.

Cyber Phone

The Monarch Butterfly: ThinkPad fans will remember the original Butterfly, a sub-notebook computer with a two-piece keyboard that folded out to its full size when the notebook was opened. The reborn Monarch is even smaller than the original Butterfly—comparable to the larger Windows CE handheld computers—and incorporates a fold-out keyboard unit.

The Wearable PC. Hortensius didn't talk about the Wearable PC, although a detailed description and pictures of a prototype were provided. The Walkman size computer (2.6x8x12 cm) weighs just under 300 g, but is a complete PC with a 233 MHz Pentium processor, 64 MB of RAM, USB port and 340 MB hard drive. The "monitor" is incorporated into a headset with a transparent display module.

Wearable PC

The presentation also covered the genesis of some existing products. The CrossPad XP, for example, was a project between IBM and Cross to develop a digital writing instrument. Hortensius said in many countries it is considered rude and unacceptable to whip out a notebook computer to take notes during a meeting. With the CrossPad XP the user can take notes on paper as usual, while capturing the writing digitally by using a digitizer under the paper.

At home with technology

Hortensius also touched briefly on IBM's revamped Home Director product family. Home Director has been around for a few years, known primarily as a master control system for X-10 devices, which allow you to program household appliances and lights to turn on or off at predetermined times. The Home Networking Centre—the most recent addition to this IBM line—will allow users to control computers as well as home-theatre equipment (TV, video, stereo) from a central point.

Business computing went from a stand-alone computing phase to a networked computing phase, and it seems like home computing is following the same trend—and quickly. When we were preparing the stories for this month's cover feature on the wired home, it became evident that relatively recent initiatives—for example using existing telephone wiring as a home networking conduit—have produced products that are usable right now.

TCP's writers are interested in technology in general, but they see a lot of new products so they aren't easily surprised. However, this was the first time in a few years that there was genuine excitement among the writers working on a feature. As first-generation products, home-networking systems undeniably have a few rough edges. However these technologies, coupled with high speed Internet access, will change the way we compute at home, as much as the inclusion of CD-ROM drives, sound cards and other multimedia features at the beginning of this decade changed what we can and want to do with a personal computer.

Interesting times ahead
David Tanaka, Editor

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I JUST READ THAT BY THE YEAR 2005 WE'LL HAVE COMPUTERS IN OUR EVERYDAY HOUSEHOLD APPLIANCES.
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OUT OF MEMORY.
MAKE SOME TOAST.
UPGRADE REQUIRED.
TURN ON THE LIGHT.
INSUFFICIENT DATA
"HEAVEN" ISN'T EXACTLY THE PLACE THAT COMES TO MIND.
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Hard drives as a backup medium

In the Letters section of your April '99 issue you gave some advice to someone with video file storage questions.

I fail to understand why hard drive mobile racks (these are devices, selling for $30 and up, that allow you to remove and interchange standard hard drives) are not more widely seen as a viable bulk storage alternative. With the cost of hard drives being so reasonable today, anyone with requirements for vast amounts of storage would do well to look at mobile hard drive racks. Although normally the drives may only be changed with the computer turned off, I see that point as the only possible drawback.

For example, an individual such as your letter writer would do well to consider purchasing half a dozen identical 10 GB drives and slide them in and out as he works on various projects. This is a much more economical alternative to the DVD-RAM you mentioned.

Brian Holmes

DT replies: You make a valid point. And, if you note in this issue's Lab Report, we have included a removable hard drive dock in our roundup of storage alternatives.

Liked the coverage

I saw Issie Rabinovitch's LAN Line column on fragmentation in Windows NT and on Diskeeper in the March '99 issue—in fact, we have received some Diskeeper Lite downloads that were directly attributable to this article.

Jobee Knight
Executive Software International

Basic consumer advice

I find myself in the market for a new computer and am wondering if your magazine publishes an edition that focuses on comparing local computer manufacturers. Basically the information I am seeking is who does the best computers, for the best prices with the best service and reliability.

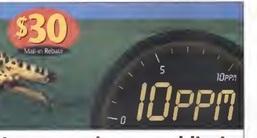
Linnhe Davis, Toronto

TCP replies. We often get requests like this, and we can only offer general advice. Asking where to buy a computer is much like asking where to buy any other complex consumer good. The quality of retail stores varies greatly and even the service within a given establishment may vary from customer to customer.

However, here are a few points you should consider:

1. ***Balancing price, quality and service.*** *Everyone wants the lowest price, the highest quality, and the best service, but this is unrealistic. You might be able to find two out of three, but companies are not charities, and are in business to make money. For example, building a good after-sales support organization costs money, which the company must work into the cost of goods sold if they want to stay profitable and in business. A company without good after-sales support might be able to sell you the same quality goods at a lower price, but if something goes wrong, may not have the support organization in place to help you.*
2. ***Brand name or clone?*** *It's hard to say which offers a "better" computer. Brand name manufacturers will offer a more consistent product. An analogy is to compare the food at national chain restaurants with the food at individually owned*

➤



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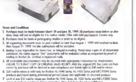

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establishments. Whether you go to a chain restaurant in Toronto or in Saskatoon, you can be reasonably sure that the food you order will be about the same price, have the same taste, etc. But picking a handful of independently owned restaurants out of the phone book and trying to figure out whether they are good or not is a more difficult task. Some will be much better than a chain, some will be worse.

Where brand name computers generally have the advantage is in warranty and service, although this is not always the case, and some of the lesser-known brands have terrific warranties.

3 ***The technology curve.** One big factor determining the cost of the computer is how much "brand new" technology it contains. With Pentium III processors just coming into the market, you may find the cost of computers using Pentium II processors will be lower. Likewise, as 10 GB or larger hard drives become the norm, computers with smaller hard drives will be less expensive.*

4 ***Where do you start?** Talk to computer-literate friends or people whose knowledge of computers you respect. Word of mouth is a reasonably reliable way to find a reputable computer dealer—or a restaurant.*

Thanks for the advice

I spent six hours in a row trying to install the Viper 550 graphics card. Totally confused I found advice on your Web page under "TNT Troubleshooting." After following the advice, all went OK. Finally I can go to sleep. Many thanks!

Ondrej Liptak

Comments from training tips fans

I have been following your training tips in *The Computer Paper* with great enjoyment but I would really like to know where you get them. I want to know as much about the "wow" aspects of Microsoft Office as I possibly can. It is difficult to find time to go through books on the subject because it takes too much time in a day that already is short about six hours! I like sharing the information with my co-workers who don't have the enthusiasm that I do for finding nifty ways of doing things. Thanks.

Christine Wadley

MJ replies: Columnist Helen Bradley is the source of these ideas and tips. Her training articles appear monthly in the print edition of The Computer Paper. *Past columns are archived at our Web site at http://www.tcp.ca*

Many thanks for your macros tutorial in the February issue of *The Computer Paper*. A terrific article. I especially liked the macro for adding the footer with the path statement included. Perhaps some day you can add the code for including Page X of Y in the footer also. Many thanks. I'll have some fun with your instructions.

Ron Hamilton

Sony to distribute music by satellite

TOKYO (NB)—As the music industry continues arguing about new music distribution technologies on the Internet, Sony Corp. is turning to satellite to offer a music download service in Japan. Music Link will launch in May and enable subscribers to purchase and digitally record songs from the service.

The new service will be launched on SkyPerfecTV, the leading digital direct-to-home broadcaster in Japan, on May 12 and use new satellite tuners and MiniDisc recorders equipped with IEEE1394 consumer high-speed digital interfaces and including built-in copyright protection. While its popularity is low in other nations, MiniDisc is widely popular in Japan, especially as a portable audio media.

A Sony spokesman explained how the service will work. "On screen, you will see a video of an artist singing and on the right hand side of the screen will appear an index of songs from that artist. Through the index you can access a certain number of songs and choose songs to download onto your MiniDisc."

The songs will be digitally compressed and transmitted in a continuous cycle, meaning users will have to wait a short period until their selected songs are transmitted and can be recorded.

Initially, users will be able to select songs from independent artists but Sony hopes to add those from major record companies in the future.

No price has been announced for the service yet. ❑

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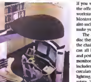


If you want to set your workspace apart from the office pod crowd, take a gander at the Aura workstation from Poetic Technologies in Montreal. Not only is it an attractive product, it also includes various environmental controls to make your space just so.

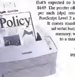
The Aura is an oval platform with a central disc that defines the workspace. The disc holds the chair, keyboard holder and footrest, which can all be controlled electronically for height and position. The disc also serves as the base for monitor stands and storage units. The Aura includes individual electronic controls for air circulation and filtration, temperature and lighting. The disc itself can be programmed to rotate 120 degrees during the course of an eight-hour day—to change the user's sight lines.

The electronic control system has a programmable memory feature. Several users can each be provided with special memory chips that will adjust the chair, keyboard and footrest to that user's pre-programmed preferences. And yes, it's expensive. The base price for an Aura workstation is $8,500 —*DT*

Poetic Technologies, Tel: 888-POETIC1 http://www.poetictech.com

WHAT'S NEW

Lexmark announces USB laser printer



Lexmark Canada Inc. has announced the Optra E310, an 8 ppm (page per minute) laser printer that's expected to have a street price of $649. The printer offers true 600x600 dots per inch (dpi) resolution, and includes PostScript Level 2 and PCL 6 emulations. It comes standard with USB (universal serial bus) support, and 2 MB of memory, which can be increased to a maximum of 66 MB.—*DT*

Lexmark Canada,
Tel: 800-LEXMARK,
http://www.lexmark.com

Vancouver technology park proposed

In an effort to keep high-tech businesses in Vancouver, city planners are considering modifications to industrial zoning bylaws while, at the same time, reviewing a proposal for a technology park in the False Creek Flats.

The proposed I-3 industrial zoning—which would be applied to the False Creek Flats area—is specifically geared to high-tech industries. It would "lighten" the level of industry that could locate in the area and increase employment densities from what is allowed under existing industrial zoning.

According to a news release from city planners, software development is a major activity of high-tech industry that has been excluded from industrial districts. The planners say the proposed I-3 zoning will allow companies that grow too big for commercial premises to remain in Vancouver rather than relocating to suburban industrial areas.

The proposed park is bordered by Vernon Drive, Great Northern Way, Station Street, and Prior Street. False Creek Flats currently includes areas zoned for heavy industry (the Finning property to the south, for example, is zoned M-2) and is adjacent to residential neighborhoods on three sides. City planners say industries approved for I-3 zoned areas—such as software companies—would be clean and quiet and more compatible with the residential neighborhoods.

While there are still several planning hoops to jump through, a concept plan for the industrial park—to be called Great Northern Technology Park—has been developed by Busby+Associates Architects. The architects envision a high-tech campus for 6,000 to 9,000 workers that incorporates new public streets, parks, recreational facilities, retail services, restaurants, and hotel and live/work spaces.

More information on the Great Northern Technology Park concept plan can be found at the Busby Web site. Information on Vancouver's planning initiatives, and details on public hearings are available at the city's Web site.—*MJ*

Busby and Associates, http://www.busby.bc.ca
Vancouver http://www.city.vancouver.bc.ca

HP opens Canadian PC plant

Hewlett-Packard Canada Ltd. has announced that it is now assembling PCs in Canada. Located within the greater Toronto area (the company will not disclose the exact location), the assembly plant is part of HP's CanBuild strategy. HP says the goal of CanBuild is to lower inventory costs as well as ensure the reliable delivery of PCs in Canada. The plant has been operating since January, and assembles two models in HP's Vectra line of business PCs. HP says additional Vectra models will be built at the plant later this year.—*DT*

Hewlett-Packard, http://www.hp.com

Apple cuts PowerBook G3 prices

Apple Computer has dropped the price on its popular new line of PowerBook G3s to $2,999, making it the industry's lowest-priced portable computer to boast a 14.1-inch screen and other features typically seen in much more expensive laptops. Apple's award-winning PowerBook G3's are designed for creative professionals, educators, students, and business professionals who need the power of a Mac on the go.

The PowerBook G3 comes with features typical of more pricey offerings from competitors. All 14.1-inch PowerBook G3 models come with a large Level-2 cache, built-in 56Kbps modems, built-in S-video output (useful for presentations), an ATI Rage LT Pro video card, built-in SCSI, and hot-swappable expansion bays with dual-battery capability. In addition, Apple will throw in Connectix Virtual PC software (including Windows 98) or an extra 64 MB of memory for customers who buy a PowerBook G3 before April 30.

"Now more customers than ever can afford our award-winning Powerbooks—the fastest and most advanced portables in the industry," said Phil Schiller, vice-president of Worldwide Product Marketing. "And with Virtual PC on your PowerBook G3, the fastest notebook in the world can now run all your Mac and Windows applications in record time."—*KS-R*

Apple Canada, Tel: 905-513-5800 http://www.apple.ca

Kodak upgrades digital cameras

Kodak has added three models to its digital camera line: the DC265, DC240 and the DC200 Plus. According to Kodak, the DC265, which supersedes the DC260 model, processes shots more quickly than the 260 and offers 1.6 million (1,536x1,024) pixel resolution. It includes a USB interface and ships with a lens cover, a 16 MB memory card, four nickel metal hydride (Ni-MH) AA rechargeable batteries, a charger, cables and software. It has a suggested retail price of $1,499.

The Kodak DC240 offers 1.3 million (1,280x960) pixel resolution. This model also has a USB interface, as well as a 3x optical zoom auto-focus lens, built-in auto flash and a 1.8-inch color LCD screen. It has a suggested retail price of $1,099.

The DC200 Plus offers one million pixel (1,152x864) resolution and will sell for $600 or less.—*DT*

Kodak Canada, Tel: 800-465-6325 ext. 36100
http://www.kodak.ca

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Continued from page **12**

Corel, PC Chips Group sign deal

Corel Corp has announced a major deal that will see Corel WordPerfect Suite 8 bundled with every computer motherboard package shipped worldwide by the PC Chips Group of companies The bundle will also include an offer to upgrade the software suite to WordPerfect Office 2000 which Corel will be introducing this year. The agreement will also see the companies launch a joint marketing campaign around their respective products

PC Chips claims to have shipped more than 15 million motherboards in 1998, and delivers computers in more than 30 countries It expects to ship 18 million motherboards this year It operates in Canada through 3D Micro Computers

PC Chips Group expects to begin selling computers with the Corel WordPerfect bundle this summer —*DT*

Headline Studio for Web animation

MetaCreations has announced the release of Headline Studio, a simple-to-use animation program especially suited for creating animated advertising banners for Web sites The company says Headline Studio uses "key point" animation, which allows the user to set key frames or elements in an animated sequence The software then renders the completed animation

MetaCreations says the program combines "broadcast quality" results with extreme ease of use A user can create the outline of an animation, and at any time change the number of frames and frame rate, allowing for easy tweaking and optimization without having to start from scratch According to MetaCreations, much effort has gone into enhancing the animation preview capability allowing animators to easily show colleagues or clients a sequence in progress and to interactively try out new ideas or changes. As the animation is being rendered, the animator can preview portions of it without interrupting the rendering to check the smoothness or speed of the animated action.

One particularly interesting feature is the bandwidth preview, which allows the animator to play back the animation at the "real-world" rates of different Internet or network connections ranging from 28.8Kbps, to ISDN line, to cable modem This offers user a reality check. One of the biggest weaknesses of online animation is that while it looks great on the animator's computer it may be unbearably sluggish and annoying and take forever to download via a slow network connection. The preview feature should help correct this.

According to an early Headline Studio user, Chris Miller of Capps Digital Studio, "Web authors now have unlimited freedom in banner creation because Headline Studio completely reinvents the workflow for banner animation design Headline Studio [combines] the numerous products needed to piece together a compelling Web banner ... into a single, simple application."

Headline Studio is being sold online by MetaCreations (minus manual and CD-ROM) for US$169 A shrink-wrapped version should be available by the end of April for a street price of around $299 —*JE*

MetaCreations,
http://www.metacreations.com/products/hls

New ATI Wonder boasts TV on a PC

TORONTO (NB)—Chip maker ATI Technologies Inc is showing off its latest product, which it claims will allow PCs to be used like a traditional television set and VCR mix.

If delivered as promised, the All-In-Wonder 128 technology could allow PC owners to transform their computers into multimedia machines offering digital picture and sound. The graphics card is powered by ATI's RAGE 128 GL graphics accelerator, which is also used in Apple's latest Power Mac desktop computers The multimedia board also offers 32 MB of memory an "intelligent" TV tuner that features instant replay and enables Web TV for Windows and digital video cassette recorder (VCR) capabilities using ATI's VCR 2.0 real time software video compression tool.

The technology also offers improved 3D graphics, video output, Digital Versatile Disc (DVD) video playback, as well as still and motion video capture. The product installs in one of a computer's AGP or PCI slots.

The technology is expected to be shipping in April Panasonic Industrial Co has already announced that its latest DVD-RAM drive is fully compatible with the All-In-Wonder

Perhaps the most striking feature of the board is that it has a built in TV tuner, which when attached to a cable television outlet, shifts a computer display into a TV set Other features include instant replay functions and video editing with the PC's hard disk acting as a digital VCR.

ATI http://www.atitech.com

Continued on page **124**

Images that jump off the page.

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Celeron 333A 128KB L2 $1,065
Celeron 366A 128KB L2 $1,120
Celeron 400A 128KB L2 $1,185
Celeron 433A 128KB L2 $1,255

Pentium III - MediaMax

Intel Pentium II/III Processor with MMX
Pentium II 440BX AGP/PCI/ISA Main Board
Internal L2 Cache
64MB 168 Pin SDRAM [PC100MHz]
1.44MB Floppy Drive
6.4GB Ultra DMA33 IDE Hard Drive
Ultra DMA33 Cont. w/2x16550 Serial,
1xBi-Directional Parallel,2xUSB Port
AGP S3 Savage 128 Bit 3D Card with 8MB SDRAM
Creative Labs Sound Blaster PCI 128 Card
44x Speed UDMA CD ROM Speakers
15" Non-Int Low Rad. SVGA Monitor PnP
ATX Mid Tower Case with CSA Power Supply
107-keys Windows 98 Keyboard, PS/2 Mouse
2 Year Parts & Service Warranty

PII 350MHz 512KB L2 ... $1,195
PII 400MHz 512KB L2 ... $1,335
PIII 450MHz 512KB L2 .. $1,655
PIII 500MHz 512KB L2 .. $2,015

Pentium III - MediaMax Pro

Intel Pentium II/III Processor with MMX Technology
Asus P2B Abit BH6 AGP/PCI/ISA ATX Main Board
Internal L2 Cache
64MB 168 Pin SDRAM (PC100MHz)
1.44MB Floppy Drive
6.4GB Ultra DMA33 IDE Hard Drive
Ultra DMA33 Cont. w/2x16550 Serial
1xBi-Directional Parallel,2xUSB Port
AGP Creative Labs nVidia TNT 3D Card with 16MB
Creative Labs Sound Blaster Live! Value Card
3rd Generation DVD-ROM
MLI-450 Sub-Woofer Speaker System
Preview 17" .28mmDP SVGA Monitor
ATX Mid Tower Case with CSA Power Supply
107-keys Windows 98 Keyboard,PS/2 Mouse
2 Year Parts & Service Warranty

PII 350MHz 512KB L2 ..$1,625
PII 400MHz 512KB L2 ..$1,765
PIII 450MHz 512KB L2 .$2,085
PIII 500MHz 512KB L2 .$2,445

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w/6x86MX300CPU	w/6x86MX333CPU
$170.00	$185.00

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8.4GB $222

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3.2GB	$162
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Creativa Labs DVD ENCORE 6x Dxr3 Kit $355.00

Power Station

440BXpert PCI/ISA Main Board (Up To 500MHz)
32MB 168 Pin High Performance SDRAM
1.44MB Floppy Drive
4.3GB Ultra DMA33 IDE Hard Drive
Ultra DMA33 Cont. w/2x16550 Serial
1xBi-Directional Parallel
On Board SIS 6326 3D Pro Card w/8MB RAM
On Board 3D Sound Pro Wavetable Sound Card
44x Speed UDMA CD-ROM,Speakers
15" Non-Int Low Rad. SVGA Monitor PnP
15" Mid-Tower Case with CSA Power Supply
104-keys Windows 95 Keyboard,PS/2 Mouse
2 Year Parts & Service Warranty

CELERON

333MHz w/128KB L2	$	805
366MHz w/128KB L2	$	860
400MHz w/128KB L2	$	925
433MHz w/128KB L2	$	995

Power Station Plus

i440LX AGP/PCI/ISA ATX Main Board
32MB 168 Pin High Performance SDRAM
1.44MB Floppy Drive
4.3GB Ultra DMA33 IDE Hard Drive
Ultra DMA33 Cont. w/2x16550 Serial
1xBi-Directional Parallel, 2xUSB Port
AGP i740 3D Accelerator Card with 8MB
Aztech AW300 64-Voice Wavetable Sound Card
44x Speed UDMA CD-ROM Speakers
15" Non-Int Low Rad. SVGA Monitor PnP
ATX Mid-Tower Case with CSA Power Supply
107-keys Windows 98 Keyboard,PS/2 Mouse
2 Year Parts & Service Warranty

CELERON

333MHz w/128KB L2	$	875
366MHz w/128KB L2	$	930
400MHz w/128KB L2	$	995
433MHz w/128KB L2	$	1,065

Superior Station 3D NOW!

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Asus P5 A-A ALi Aladdin V AGP/PCI/ISA Board w/512KB
32MB 168 Pin High Performance SDRAM(PC100MHz)
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4.3GB Ultra DMA-33 IDE Hard Drive
AGP S3 Savage 128 Bit 3D Card with 8MB
Ultra DMA IDE Controller
2 x 16550 Serial, 1 Parallel & 2xUSB Port
15" Non-Int SVGA Monitor .28mm dp PnP
ATX Mid-Tower Case with CSA Power Supply
107-keys Win98 Keyboard, PS/2 Mouse
PCI ESS Solo-1 3D Wavetable Sound Card
44x Speed UDMA CD-ROM Speakers
2 Year Parts & Service Warranty

AMD K6-2 3D

K6-2 3D 350	$	930
K6-2 3D 380	$	955
K6-2 3D 400	$	990
K6-2 3D 450	$	1,125

Video Graphics Adapters

ATI 3D Charger AGP 4MB/8MB	$45/67
ATI All-in-Wonder Pro AGP Card 8MB	$218.00
ATI Xpert98/Xpert@Play AGP Card 8MB	$78/108
ATI Xpert99 Rage 128 AGP Card 8MB	$107.00
ATI Rage 128 AGP Card 16MB	$182.00
ATI Rage Fury/Magnum AGP 32MB	$254/398
ATI TV Wonder Tuner Card (NTSC)	$123.00
ASUS AGP-V3400 nVIDIA TNT TV Out,Video-in 16MB	$310.00
Creative Labs Graphics Blaster Banshee AGP 16MB	$198.00
Creative Labs Graphics Blaster TNT AGP 16MB	$138.00
Diamond Monster 3D II Voodoo 2 Card 12MB	$218.00
Matrox Millennium/Mystique G200 AGP 8MB SGRAM	$148/178
Matrox Marvel G200-TV (15-in-1)	$383.00
Matrox Rainbow Runner G-Series PCI Card	$280.00
Intel i740 AGP w/8MB SDRAM	$67.00
S3 Trio 64 PCI w/2MB EDORAM	$27.00
S3 Savage 128 3D AGP 8MB	$76.00

Monitors

ADI E44/MP 15" N/I L/R(1280x1024 .28mmDP)	$236/262
ADI 5P+/5GT 17" N/I,L/R(1280x1024, .28/.25mmDP)	$435/555
ADI 80 21" N/I,L/R(1600x1280, .28mmDP)	$1280.00
Mag XJ500T/700T 15"/17" N/I (1280x1024, .26mmDP)	$274/465
NEC A500+/A700+ 15"/17" .28mmDP DotTrio	$785/585
NEC E500/E700 15"/17" .28mmDP Cromaclear	$888/585
NEC E900+ 19" MicroFilter(1600x1200 .25mmDP)	$875.00
Panasonic E70 17" (1600x1000 .27mmDP)	$580.00
Panasonic S50/SL70 15"/17" (1280x1024, .27mmDP)	$268/466
Panasonic SL90 19" FS(1600x1200 .26mmDP)	$870.00
Panasonic S110 21" (1600x1200 .28mmDP)	$1425.00
Preview 15" N/I L/R(1600x1024,.28mmDP)	$185.00
Proview 17" N/I,L/R(1280x1024, .26mmDP)	$320.00
Sony 100ES 15" N/I,L/R(1280x1024 .25mmDP)	$385.00
Sony 200ES 17" N/I,L/R(1280x1024 .25mmDP)	$218.00
Sony 200GS 17" N/I,L/R(1280x1024, .25mmDP)	$750.00
Sony 400PS 19" N/I,L/R(1600x1200, .25mmDP)	$1000.00
Sony 500PS 21" N/I,L/R(1600x1200, .25mmDP)	$1800.00
Samsung 510S 15" N/I,L/R(1280x1024, .28mmDP)	$305.00
Samsung 710S 17" N/I,L/R(1280x1024, .28mmDP)	$498.00

HD/FD Controllers

ISA IDE HD/FD Controller with I/O UART 16550	$22.00
Adaptec 1505/2906 SCSI CD-ROM Controller	$71/88
Adaptec 2910/2930 PCI SCSI Controller	$139/160
Adaptec 2940U2 PCI Ultra 2 SCSI Controller	$408.00
Adaptec 2940U/2940UW PCI SCSI Controller	$206/310
Adaptec 3940U2W PCI Ultra 2 SCSI Controller	$635.00
Adaptec AAA-131CA RAID SCSI Kit	$650.00

Keyboards & Cases

Fujitsu 4725/5725 Enhanced 104 Keys	$60/78
Cherry Windows 98 Keyboard	$18.00
Logitech Deluxe Keyboard	$25.00
Logitech Internet Keyboard	$38.00
Logitech Cordless Desktop-Keyboard & Mice	$128.00
Microsoft Natural Keyboard Elite 98	$40.00
17/19" ATX Mid Size Tower w/ CSA Power Supply	$60/78
20" ATX Tower with 250W CSA Printer Supply	$100.00
Full Size Tower with 230W CSA Printer Supply	$90.00
18/19" Mid Size Tower with CSA Power Supply	$33/43

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1.2MB 5.25"/1.44MB 3.5" Floppy Drive	$30/22
Panasonic LS-120 120MB Floppy Drive(3x Speed)	$122.00
Ultra DMA 10.2GB/8.4GB/ 7.2GB	$254/540/445
IBM 10GB/WD 10GB 7200 RPM HDD	$378/930
Iomega 100MB Int/Parallel ZIP Drive	$88/149
Iomega 2GB Int/Ext JAZ Drive	$408.00
HP Colorado 5GB Int/Ext Backup Drive	$255/300
HP Colorado 8GB Int/Ext Backup Drive	$325/380
Seagate 8GB TR-4 Int IDE/SCSI Tape Backup Drive	$380/410

Motherboards

Intel N440BX Pentium II Server Board	$620.00
Intel L440GX Pentium II / III Server Board	$930.00
ABIT BH6 440BX Pentium II/III Board (AGP)	$180.00
ABIT BX6 440BX Pentium II/III Board (Ver 2.0)	$182.00
ASUS P5 A-B-A 100MHz AGP Socket 7 512KB L2	$188.00
ASUS MEW-M Celeron 440LX Socket 370 Board	$154.00
ASUS P2B97 440BX Pentium II/III Board (AGP)	$188.00
ASUS P2B-S 440BX Ultra2SCSI Board	$400.00
ASUS P2B-DS 440BX,Dual CPU,Ultra2SCSI Board	$710.00
PC Partner VIA MP3 100MHz AGP, Socket 7 512KB L2	$107.00

MultiMedia

Aztech AW300 Wavetable Sound Card (A3D)	$53.00
Creative Labs Sound Blaster 16 PnP	$38.00
Creative Labs Sound Blaster AWE64/ PCI 128	$66/78
Creative Labs Sound Blaster Live!/Live Value	$278/88
44X/48X IDE CD-ROM Drive	$63/80
Hewlett Packard 8100i 8x Int IDE CDRW	$405.00
Hitachi 3rd Generation DVD ROM Drive	$158.00
Pioneer/Toshiba 40X SCSI CD-ROM Drive	$112/180
Panasonic 7502B Int 4x8 SCSI CD-R Drive	$380.00
Sony CRX100E1 8 Int 4x8x24 IDE CDRW Drive	$388.00
Sony 3rd Generation DVD ROM Drive (5x/32X)	$199.00
Yamaha CRW4416 Int/Ext 4x4x16 SCSI CDRW	$488/578

Modem & Mice

56Kflex V 90 PCI Int. Modem w/Voice	$40.00
Diamond SupraMax 56K v.90 PCI Voice	$80.00
Diamond SupraExpress 56K v.90 Int Voice	$110.00
US Robotics Sportster ISDN 128K Int.	$275.00
US Robotics 56K v.90 Int/Ext Fax Modem	$118/205
US Robotics 56K v.90 Int/Ext Voice Modem	$118/270
Zoltrix 56K v.90 External Fax Modem	$100.00
Diamond GyroMouse Pro	$148.00
Genius NetMouse with Magic-Button	$12.00
Logitech Mouseman/FirstMouse+ OEM	$18.00
Logitech TrackMan Marble FX	$108.00
Microsoft J Mouse/IntelliMouse	$32/38
Microsoft Compatible Mouse	$8.50

Printers

Canon BJC-2000 Color Inkjet	$198.00
Canon BJC-4400ex/4400 Color Inkjet	$198/188
Canon BJC-5000/7000L Color Inkjet	$375/485
Brother HL1020 Laser Printer 600dpi 10ppm	$375.00
Epson Stylus 440 Color Inkjet 720dpi	$168.00
Epson Stylus 640/740 Color Inkjet 1440dpi	$250/383
Epson Stylus Photo700 Color Inkjet 1440dpi	$398.00
Epson Stylus PhotoEX,11.7"x44"	$618.50
Epson Stylus 850/850N Color Inkjet 1440dpi	$628/755
Epson Stylus 800 Color Inkjet 1440dpi	$870.00
HP 695C/710C Deskjet Color Printer	$248/285
HP 890C/895Cxi Deskjet Color Printer	$458/558
HP 1120C/2000C Deskjet Color Printer	$689/815
HP 2500C Professional Series Color Printer	$1438.00
HP 4000 LaserJet, 1200 dpi 17ppm	$1788.00
HP 1100/1100A LaserJet, 600 dpi 8 ppm	$628/749
HP 2100/2100M LaserJet 1200 dpi 10 ppm	$1080/1220

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Pentium III - Game Blaster

Intel Pentium II/III Processor with MMX Technology
Asus P2B/Abit BH6 440BX AGP/PCI ISA ATX Main Board
64MB 168 Pin High Performance SDRAM (PC100MHz)
1.44MB Floppy Drive
10.2GB Ultra DMA33 IDE Hard Drive
Ultra DMA33 Cont. w/2x16550 Serial,1xBi-Directional Parallel
AGP ATI Rage Fury 3D Graphics Card with 32MB (TV Out)
Creative Labs Sound Blaster Live! Value Card-Environmental Audio
3rd Generation DVD-ROM Drive
GNT 5000A Multimedia Sub woofer Speaker System
Optiquest Q71 17" .27mm Dot Pitch Non-Int SVGA Monitor
ATX Mid Tower Case with CSA Power Supply
107-keys Windows 98 Keyboard,PS/2 Mouse

PII 350MHz 512KB L2 .....$1,845
PII 400MHz 512KB L2 .....$1,985
PIII 450MHz 512KB L2 ....$2,305
PIII 500MHz 512KB L2 ....$2,665

Sound Blaster Live! Value

Monthly Special !! Big Saving!!!

SIMM Memory

16MB 60ns 72-Pin EDO SIMM	[illegible]
32MB 60ns 72-Pin EDO SIMM	$96.00
32MB 168-Pin SDRAM	$59.00
64MB 168-Pin SDRAM	$113.00
128MB 168-Pin SDRAM	$223.00
64MB SDRAM PC-100 compliant	$112.00
128MB SDRAM PC-100 compliant	$223.00
64MB ECC SDRAM PC-100	$150.00
128MB ECC SDRAM PC-100	$290.00
4MB 70ns 30-Pin SIMM	$18.00

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100MB Zip Cartridge
organize, move & Backup your Stuff $13.50

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BASF CDR - $1.88
Verbatim CDR - $2.18
BASF CDRW - $12.00

NetGear

EN104TP 10BaseT 4 Port Hub
$54.00

Impression

56KBps V.90 Internal Voice Fax Modem
$40.00

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NetWare v3.2 5/10 User	$1306/3260
NetWare v3.2 25/50 User	$4748/6395
NetWare v3.2 100/250 User	$8970/10000
NetWare v3.2 Enhancement Pack	$525

IntraNetWare v5

NetWare 5 Server Plus 5 User Lic	$1535
NetWare 5 5/10 Additive Lic. Only	$1283/1632
NetWare 5 25/50 Additive Lic. Only	$5108/6280
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MICROSOFT NT

Windows NT Server
Windows NT Workstation

Windows NT Server v4.0 CD w/5 Clients Lic.	$1150
Windows NT Server v4.0 CD w/10 Clients Lic.	$1680
Windows NT v4.0 Client Access Lic.	[illegible]
Windows NT Server v4.0 upgrade w/5 Clients Lic.	$455
Windows NT Server v4.0 upgrade w/10 Clients Lic.	$615
Windows NT Workstation 4.0 CD	$445
Windows NT Workstation 4.0 upgrade	$210
BackOffice Small Business Server v4.5 w/5 Clients	$2100
BackOffice Server v4.5 w/5 Clients	[illegible]
Microsoft SMS version 2.0 w/10 Clients Lic.	[illegible]
Microsoft SMS version 2.0 w/25 Clients Lic.	[illegible]
Microsoft SNA Server v4.0 w/5 Clients Lic.	[illegible]

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440BXpert Pentium II AT Board with SiS 6326 3D Graphics & Sound Pro Card (100MHz Bus)

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Intel Celeron 400MHz w/128KB L2	$375
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AMD K6-2 3D 380 MHz	$265
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Series
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4.5GB	ST34573N	7.5ms	512KB	7200	ULTRA SCSI	$555
4.5GB	ST34573W	7.5ms	512KB	7200	ULTRA WIDE	$555
4.5GB	ST34573LW	7.5ms	1MB	7200	ULTRA 2 SCSI	$580
4.5GB	ST34502LW	6ms	1MB	10000	ULTRA 2 SCSI	$745
6.5GB	ST36530W	10ms	512KB	7200	ULTRA WIDE	$420
9.1GB	ST39140W	10ms	512KB	7200	ULTRA WIDE	$580
9.1GB	ST39173N	8ms	512KB	7200	ULTRA SCSI	$645
9.1GB	ST39173W	8ms	512KB	7200	ULTRA WIDE	$645
9.1GB	ST39173LW	8ms	512KB	7200	ULTRA 2 SCSI	$650
9.1GB	ST39175LW	6.8ms	1MB	7200	ULTRA 2 SCSI	$705
9.1GB	ST39102LW	6ms	1MB	10000	ULTRA 2 SCSI	$900
18.2GB	ST118273W	8ms	512KB	7200	ULTRA WIDE	$1160
18.2GB	ST118273LW	8ms	1MB	7200	ULTRA 2 SCSI	$1160
18.2GB	ST318275LW	6.8ms	1MB	7200	ULTRA 2 SCSI	$1280
18.2GB	ST118202LW	6.7ms	1MB	10000	ULTRA 2 SCSI	$1560
9.1GB	39130U2	7.5ms	512KB	7200	ULTRA 2 SCSI	$645
9.1GB	LP9100U2	6.5ms	1MB	7200	ULTRA 2 SCSI	$655
9.1GB	309170U2	7ms	2MB	7200	ULTRA 2 SCSI	$780
9.1GB	9LZXU24M	5.3ms	4MB	10020	ULTRA 2 SCSI	$835
18.2GB	XP18200U2	7.5ms	1MB	7200	ULTRA 2 SCSI	$1160
18.2GB	318350U2	7ms	2MB	7200	ULTRA 2 SCSI	$1345
18.2GB	18ZXU2	5.3ms	4MB	10020	ULTRA 2 SCSI	$1585
36GB	XP36U2	7.5ms	4MB	7200	ULTRA 2 SCSI	$2325
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4.55GB	WD4550-0024	8ms	512KB	7200	ULTRA 2 SCSI	$525
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9.1GB	WD9100-0024	8ms	512KB	7200	ULTRA 2 SCSI	$605
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9.1GB	QM309100PX	7.5ms	512KB	7200	ULTRA 2 SCSI	$585
9.1GB	QM309100TD	8ms	1MB	7200	ULTRA 2 SCSI	$640
18.2GB	QM318200TD	8ms	1MB	7200	ULTRA 2 SCSI	$1180

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ACS95W PowerCube Speaker [illegible] w/Headphone Jack	[illegible]
ACS44W PowerCube Speaker [illegible]	[illegible]
ACS45 [illegible] PowerCube 3 pcs Speaker w/Wood Subwoofer	$115.00
ACS48 PowerCube Plus Speaker (3 pcs)	[illegible]
ACS [illegible] Digital PowerCube Speaker 3 pcs with USB	$182.00
ACS251 Powered Subwoofer	$120.00
ADA [illegible] PowerCube Speaker [illegible]	[illegible]

YAMAHA

YST-M8.5 Watts/ch Multimedia Speaker	[illegible]
YST-M55 10 Watts/ch Multimedia Speaker	$79.00
YST-MSW10 Active Subwoofer System	$129.00
YST-M20 [illegible] Multimedia Speaker w/DSP	[illegible]
YST [illegible] Multimedia Speaker & Subwoofer (3 pcs)	[illegible]
YST [illegible] DSP	$168.00

CREATIVE

PC Works Desktop Speaker	$55.00
PC Works Four Point Surround Speaker	$130.00
PC Works Four Point Surround FPS2000 Digital Speaker	[illegible]
SoundWorks Amplified Speaker & Subwoofer	[illegible]
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Extensa 501DX

Intel Pentium 266MHz MMX
32MB Memory
3.2GB Hard Drive
20X CD-ROM/built-in sound
12.1" DSTN Display
56Kbps Fax Modem/USB

Model	CPU	RAM	HDD	CD	Display	Price
502DX	266MMX	32MB	4GB	20X	12.1 HPA	$1,900
508T	300MMX	32MB	4GB	20X	12.1 TFT	$2,360
711TE	PII266	64MB	4GB	24X	13.3 TFT	$3,210
712TE	PII300	64MB	6GB	24X	13.3 TFT	$3,655
720TX	PII300	64MB	6GB	24X	14.1 TFT	$3,945

ThinkPad i-1411

Intel Pentium 300MHz MMX
32MB Memory
4.3GB Hard Drive
24X CD ROM
56Kbps Fax Modem
12.1" TFT Display

Model	CPU	RAM	HDD	CD	Display	Price
i-1451	300MMX	64MB	4.3GB	24X	12.1 TFT	$2,805
380Z	PII233	32MB	4.0GB	24X	13.3 TFT	$2,970
380Z	PII300	32MB	4.0GB	24X	13.3 TFT	$3,620
390	233MMX	32MB	3.2GB	24X	12.1 TFT	$2,415
390	PII233	32MB	3.2GB	24X	12.1 TFT	$2,690
390	PII266	64MB	4.3GB	24X	14.1 TFT	$3,960
390E	Cel300	32MB	3.2GB	24X	12.1 TFT	$2,765
390E	PII300	32MB	3.2GB	24X	13.3 TFT	$3,320
390E	PII300	64MB	4.3GB	24X	14.1 TFT	$3,870
390E	PII333	64MB	6.4GB	24X	14.1 TFT	$4,425
560Z	PII233	32MB	4.0GB		12.1 TFT	$3,340
560Z	PII300	64MB	6.4GB		12.1 TFT	$4,275
600	PII300	32MB	4.0GB	24X	13.3 TFT	$4,550
600	PII366	64MB	6.4GB	24X	13.3 TFT	$6,040
600	PII366	64MB	6.4GB	DVD	13.3 TFT	$6,136
770E	PII266	32MB	5.1GB		14.1 TFT	$5,185
770ED	PII266	64MB	5.1GB	DVD	14.1 TFT	$6,495
770X	PII300	64MB	8.1GB	DVD	14.1 TFT	$5,850
770X	PII300	128MB	8.1GB	DVD	13.7 TFT	$6,120
770Z	PII366	128MB	14.1GB	DVD	14.1 TFT	$7,250
770Z	PII366	128MB	14.1GB	DVD	13.7 TFT	$7,430

FUJITSU

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Business Computing

Model	CPU	RAM	HDD	CD	Display	Price
E342	Cel300	32MB	3.2GB	24X	12.1 TFT	$2,235
E351	PII300	64MB	4.0GB	24X	13.3 TFT	$3,245
E360	PII333	64MB	6.4GB	24X	13.3 TFT	$3,830
E370	PII366	64MB	6.4GB	24X	13.3 TFT	$4,535
L440	PII266	32MB	4.0GB		13.3 TFT	$3,435
[illegible]	PII266	32MB	4.0GB	20X	13.3 TFT	$3,720

COMPAQ

AMD K6-2
Presario 1260

AMD K6-2 333MHz CPU
64MB RAM exp. to 160MB
4GB Hard Drive
128-Bit 3D Graphics 2MB
24X CD ROM
56Kbps Fax Modem
12.1" TFT Display

Model	CPU	RAM	HDD	CD	Display	Price
1500c	Cel233	32MB	4.0GB	24X	12.1 DSTN	$2,295
1500c	Cel300	32MB	4.0GB	24X	12.1 TFT	$2,790
1700	PII233	32MB	3.2GB	24X	12.1 CSTN	$2,525
1700	PII300	32MB	5.0GB	24X	14.1 TFT	$4,255
1750	PII300	64MB	4.0GB	24X	13.3 TFT	$3,960
1750	PII333	64MB	4.0GB	24X	13.3 TFT	$4,570
1750	PII366	64MB	4.0GB	24X	14.1 TFT	$5,310
3500	PII266	32MB	4.1GB		12.1 TFT	$3,750
3500	PII300	64MB	6.4GB		13.3 TFT	$4,935
3500	PII333	32MB	4.1GB		12.1 TFT	$4,480
3500	PII366	64MB	6.4GB		13.3 TFT	$5,945
7600	PII300	64MB	8.0GB	DVD	14.1 TFT	$5,900
7600	PII366	64MB	14.0GB	DVD	14.1 TFT	$7,445

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- Razor-Sharp Screen
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- Palm OS 3.1

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3Com

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- Razor-Sharp Screen
- Infrared
- Palm OS 3.1
- Stores Up to 6000 Address, 5 Years of Appointment 1500 Memos & 1500 To-Do Items

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V.90 K56Flex Modem

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24X CD ROM
56KBps V.90 Fax Modem
Built-in Sound System

Model	CPU	RAM	HDD	CD	Display	Price
7000CT	[illegible]	[illegible]	[illegible]		12.1 TFT	$4,775
7020CT	PII366	64MB	6.4GB		13.3 TFT	$5,250
3010CT	P266	32MB	3.2GB		10.4 TFT	$2,845
3020CT	P300	32MB	6.4GB		10.4 TFT	$3,290
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	13.3 TFT	$3,075
4030CDS	Cel300	64MB	4.3GB	24X	13 DSTN	$2,585
4030CDT	Cel300	64MB	4.3GB	24X	13.3 TFT	$2,900
4090CDT	PII333	64MB	6.4GB	24X	14.1 TFT	$3,845
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
8000	PII266	32MB	3.8GB	24X	12.1 TFT	$3,730
8000	[illegible]	[illegible]	[illegible]	[illegible]	13.3 TFT	[illegible]
8000	PII266	64MB	7.6GB	24X	14.1 TFT	$4,735
8000	PII300	64MB	7.6GB	DVD	14.1 TFT	$5,425
8000	PII366	64MB	9.3GB	24X	14.1 TFT	$6,100
8000	[illegible]	[illegible]	[illegible]	DVD	[illegible]	[illegible]
110CT	P233	32MB	4.3GB		7.1 TFT	$2,550

PCMCIA / PC Cards

Adaptec APA-1450A SlimSCSI Kit	$125.00
Adaptec APA-1460A SlimSCSI Kit	[illegible]
Adaptec APA-1480A SlimSCSI Kit (CardBus)	[illegible]
Addonics Pocket CD 8X PCMCIA CD-ROM Drive	$300.00
Focus Enhancement TView PresenCard(PC to TV)	[illegible]
Intel Pro/100 Mobile LAN CardBus II RealPort	[illegible]
Intel Pro/100 Mobile LAN CardBus II	$220.00
Intel Pro/100 Mobile LAN 16 Bit PC Card	[illegible]
Intel Pro/100 LAN+56K Modem CardBus II RP	[illegible]
Intel Pro/100 LAN+56K Modem CardBus II	$440.00
Kingston EtheRx PCMCIA Ethernet Combo	$175.00
Megahertz 3CXFE575BT 10/100 LAN CardBus	$220.00
Megahertz 3C574-TX 10/100 LAN	[illegible]
Megahertz 3CXE589ET 10BaseT	[illegible]
Megahertz 3CXE589EC 10Base2	[illegible]
Megahertz 3CCM156 56K Global Modem	[illegible]
Megahertz 3CXM356 56K Cellular Modem(XJack)	[illegible]
Megahertz 3CXM056 56K X2/V Modem	[illegible]
Megahertz 3CCFEM556B 10/100 LAN+56K Modem	[illegible]
Megahertz 3CXEM556BT 10BaseT+56K Modem	[illegible]
Megahertz 3CXEM556BC 10Base2/T+56K Modem	[illegible]
Micro Solutions 24X Bantam Ultra Light CD-ROM	[illegible]
Micro Solutions 24X Bantam CD w/Sound	[illegible]
Micro Solutions 20X Backpack CD-ROM	[illegible]
Micro Solutions 20X Backpack 32X CD w/Sound	[illegible]
Netgear FA410 10/100BaseT Ethernet PCMCIA	[illegible]
New Media BaseJammer PCMCIA PnP	[illegible]
New Media BASICS Game Port	[illegible]
Nogatech Micro Capture Card	[illegible]
Nogatech TV Tuner Notebook TV PCMCIA	[illegible]

Carrying Case

Targus Notepac CNP1/CN01	[illegible]
Universal Notebook Case CUN1	[illegible]
Platinum Leather Case CPLC1	$220.00
Business Traveler Case CLB1	[illegible]
Business Rookie Case CKN2	[illegible]
Business Commuter Case CBC2	$120.00
Universal Rolling Case CURC1	[illegible]
Air Notepack Plus w/APS Black ONP1A	[illegible]
Air Deluxe Universal Case DU1A	[illegible]

Kingston

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TOSHIBA-Notebook

T100 T100 T150 T115 T400 T400 T410 T415,	[illegible]
T400 T400 T400 T435 T610, Tecra700 Series ..	[illegible]
Satellite 220 Satellite Pro 400 Tecra 750	[illegible]
Satellite Pro 440, 445, 460, 470, 480	[illegible]
Portege 300,320 300	[illegible]
Portege 7000CT Satellite 4000,4010 Tecra8000	[illegible]
Tecra 500, 510 520 530 ,550 Portege 650, 660	[illegible]

IBM-ThinkPad

ThinkPad 760ES/ED/EL/XD	[illegible]
ThinkPad 365X/XD II 380,385	[illegible]
ThinkPad 770C/CD/L/LD	[illegible]
ThinkPad 765, 760	[illegible]
ThinkPad 380Z	[illegible]
ThinkPad 770,770E,770ED TP390 i-Series	[illegible]
ThinkPad 390	[illegible]

Compaq-Notebook

Armada 7700 Series,7300 Series 1510 Series	[illegible]
Armada 7400 7800, 1500C, 3500, 17XX	[illegible]
Armada 4100 4110, 4120, 4130, 4131,4200T	[illegible]
Presario 1055, 1060, 1200, 1267	[illegible]

Acer-Notebook

Extensa 390/367/368	[illegible]
Extensa 501DX, 502T 710TE, 711TE, 712TE	[illegible]

Hard Drive Upgrades For Portables

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2.5" EIDE Hard Disk Drive

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Canon

BJC-50 Inkjet Printer
$462

Xircom

Xircom CE 10 PCMCIA Ethernet 10 BaseT (RJ45)

$58

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HP Jornada 680 with Modem $1205
HP Jornada 820 with Modem $1380

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HP660LX 32MB/56K MODEM $1225

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- 15" SVGA Monitor
- On Board EtherExpress Pro+ 10/100
- 56Kbps External Fax Modem
- ATX NetServer Case with 300 Watts Power Supply
- 14 Device Bays 5.25" x 9 & 3.5" x 6
- 104 keys Keyboard & PS/2 Mouse

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PIII-450MHz....$2,655
PIII-500MHz....$3,015

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- 1.44MB Floppy Drive
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- On Board Adaptec AIC 7896 Dual Channel Ultra 2 SCSI Controller
- On Board GD5480 Video Card 2MB
- 40x Speed SCSI CD-ROM
- 15" SVGA Monitor
- On Board EtherExpress Pro 100+ LAN
- 56Kbps External Fax Modem
- ATX NetServer Case with 300 Watts Power Supply
- 14 Device Bays, 5.25" x 9 & 3.5" x 6
- 104-keys Keyboard & PS/2 Mouse

PII-350MHz.....$3,230
PII-400MHz.....$3,370
PIII-450MHz....$3,690
PIII-500MHz....$4,050

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- Asus P2B Pentium II / III Board
- 128MB SDRAM (100 MHz System Bus)
- 1.44MB Floppy Drive
- IBM 10GB Hard Drive UDMA 33 9ms access time 7200 RPM
- ATI Rage 128 Magnum 3D Graphics Card with 32MB
- 44x Speed UDMA CD-ROM
- Optiquest V95 19" SVGA Monitor 1600x1280 resolution, 0.26mm DP
- ATX Mid-Tower Case w/Power Supply
- Fujitsu 104-keys Keyboard /w MS Mouse

PII-350MHz.....$2,285
PII-400MHz.....$2,425
PIII-450MHz....$2,745
PIII-500MHz....$3,105

3D Station BX²

(Dual Processor Capable)

- Asus P2BDS Pentium II / III Board
- 256MB SDRAM (100 MHz System Bus)
- 1.44MB Floppy Drive
- Seagate ST39102LW 9.1GB Hard Drive Ultra2SCSI 10000 RPM
- 3Dlabs Oxygen GMX Dual GLint GMX chipset with 96MB
- 44x Speed UDMA CD-ROM
- Viewsonic G810 21" SVGA Monitor 1600x1280 resolution 0.25mm DP
- ATX Mid-Tower Case w/Power Supply
- Fujitsu 104-keys Keyboard/w MS Mouse

PII-350MHz.....$6,570
PII-400MHz.....$6,710
PIII-450MHz....$7,030
PIII-500MHz....$7,390

Video Cards

Leadtek	Winfast 2300	Permedia II chipset with 8MB PCI or AGP	$149.00
	Winfast 2530	GLint MX + Gamma chip w/8MB+16MB AGP	$1700.00
	Winfast 3100	Dual GLint GMX chipset w/16MB+80MB AGP	$2555.00
DIAMOND	FireGL 4000	Mitsubishi 3D Pro/2MP chipset 15MB+16MB	$1750.00
	FireGL 5000	REALimage 2100 chipset 20MB+15/32MB	$3,750.00
3Dlabs	Oxygen ACX	Permedia 2 processor with 8MB SGRAM AGP	$210.00
	Oxygen VX1	GLINT R3 processor with 32MB SGRAM AGP	$450.00
	Oxygen DP402	4 Oxygen chips w/32MB, Support Win95/NT	$1375.00
	Oxygen RPM	3D Labs RPM chipset w/64MB Support Dual Screen	$1425.00
	Oxygen GMX	Dual GLint GMX chipset w/96MB AGP	$2625.00
E&S	ECLIPSE II/20	AccelGraphics 3D chipset 20MB AGP	$1750.00
	ECLIPSE II/32	AccelGraphics 3D chipset 32MB AGP	$1950.00
	AccelGMX2000	Dual GLint GMX chipset w/16MB+80MB AGP	$2530.00
	AccelGALAXY/36	RealImage 2000 chipset 36MB AGP	$1655.00
	AccelGALAXY/52	RealImage 2000 chipset 52MB AGP	$1815.00

Monitors

MITSUBISHI	DScan 90e	90e 19"/18"V 0.25mmDP 1600x1280@75Hz	$668.00
	DPro 900u	900u 19"/18"V 0.25mmDP 1600x1280@75Hz USB	$1205.00
	DPlus 100e	100e 21"/19.7"V 0.28mmAG, 1600x1280@85Hz	$1665.00
	DPro 1000u	1000u 21"/19.7"V 0.28mmDP 1600x1440@75Hz	$2065.00
	DPro 2070u	2070u 21"/19.7"V 0.25mmDP 1800x1440@80Hz	$2380.00
	DPro 91TXM	91TXM 21"/19.7"V 0.28mmAG, 1600x1280@75Hz	$1625.00
NEC	E900+	19"/18"V 0.26mmDP 1600x1200@77Hz	$975.00
	E1100+	21"/19.8"V 0.28mmDP 1600x1200@77Hz	$1450.00
	P750	17"/15.6"V 0.25mmDP 1600x1200@75Hz	$815.00
	P1250+	21"/19.8"V 0.28mmDP 1800x1440@73Hz	$1650.00
	FP950	19"/18"V 0.25mmDP 1800x1440@73Hz	$1265.00
	FP1350	22"/20"V 0.25mmDP 1800x1440@79Hz	$2110.00
SONY	GDM-500PS	21"/19.8"V 0.25mmDP 1600x1200@85Hz	$2060.00
	GDM-F400	19"/18"V 0.22mmDP 1600x1200@85Hz	$1600.00
	GDM-F500	21"/19.8"V 0.22mmDP 1800x1440@80Hz	$2500.00
	GDM-W900	24"/22.5"V 0.28mmDP 1920x1200@76Hz	$3350.00

Plotters

hp	430	DesignJet 430 A-D Monochrome 600DPI	$2595.00
	430	DesignJet 430 A-E Monochrome 600DPI	$3600.00
	450C	DesignJet 450C A-D Color 300/600DPI	$3120.00
	450C	DesignJet 450C A-E Color 300/600DPI	$4528.00
	455CA	DesignJet 455CA A-D Color 300/600DPI	$4150.00
	455CA	DesignJet 455CA A-E Color 300/600DPI	$5430.00
	750C Plus	DesignJet 750C Plus A-D 300/600DPI Rollfeed	$7800.00
	750C Plus	DesignJet 750C Plus A-E 300/600DPI Rollfeed	$9050.00
	755CM	DesignJet 755CM A-E 300/600DPI Rollfeed 72MB	$11800.00
	1050C	DesignJet 1050C A-E Color 600DPI	$11700.00
	1055CM	DesignJet 1055CM A-E Color 600DPI	$15610.00
	2000CP	DesignJet 2000CP A-E Color Printer w/ings	$13000.00
	2500CP	DesignJet 2500CP A-E Color Postscript Printer	$15600.00
	3000CP	DesignJet 3000CP 54" Color 600DPI Photo Quality	$18200.00
	3500CP	DesignJet 3500CP 54" Color 600DPI Postscript	$22000.00

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		Model	Dot Pitch	Max Res.	Viewable	H-Scan	Price
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	ViewSonic	E655	0.28mm	1280x1024	13.8"	30-70KHz	$ 260
	ViewSonic	P655	0.27mm	1280x1024	14.0"	30-70KHz	$ 340
	ViewSonic	G653	0.28mm	1024x768	13.8"	30-70KHz	$ 310
	ViewSonic	GA655	0.27mm	1280x1024	14.0"	30-70KHz	$ 340
17"	OPTIQUEST	Q71	0.27mm	1280x1024	16.0"	30-70KHz	$ 360
	OPTIQUEST	V73	0.26mm	1280x1024	15.8"	30-69KHz	$ 465
	OPTIQUEST	V75	0.26mm	1600x1280	16.0"	30-85KHz	$ 580
	ViewSonic	E771	0.27mm	1280x1024	16.0"	30-70KHz	$ 450
	ViewSonic	EA771	0.27mm	1280x1024	16.0"	30-70KHz	$ 500
	ViewSonic	G773	0.26mm	1280x1024	16.0"	30-70KHz	$ 575
	ViewSonic	GS771	0.27mm	1280x1024	16.0"	30-70KHz	$ 560
	ViewSonic	GT775	0.25mm	1600x1200	16.0"	30-80KHz	$ 565
	ViewSonic	PS775	0.25mm	1600x1200	16.0"	30-95KHz	$ 686
	ViewSonic	PT771	0.25mm	1600x1280	16.0"	30-92KHz	$ 730
	ViewSonic	PT775	0.25mm	1600x1280	16.0"	30-96KHz	$ 720
19"	OPTIQUEST	V95	0.26mm	1600x1280	18.0"	30-95KHz	$ 770
	ViewSonic	G790	0.26mm	1600x1280	18.0"	30-96KHz	$ 780
	ViewSonic	PS790	0.25mm	1600x1280	18.0"	30-95KHz	$ 805
	ViewSonic	PT795	0.25mm	1920x1440	18.0"	30-110KHz	$1,380
21"	OPTIQUEST	V115	0.28mm	1600x1280	20.0"	30-95KHz	$1,280
	ViewSonic	G810	0.25mm	1600x1200	20.0"	30-89KHz	$1,380
	ViewSonic	P810	0.25mm	1600x1200	20.0"	30-95KHz	$1,525
	ViewSonic	P815	0.25mm	1800x1440	20.0"	30-115KHz	$1,780
	ViewSonic	PT813	0.28mm	1600x1200	20.0"	30-107KHz	$1,710
	ViewSonic	P817	0.26mm	2048x1536	20.0"	30-137KHz	$2,430
	ViewSonic	MB110	0.26mm	1800x1200	20.0"	30-96KHz	$1,540

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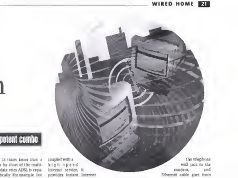

Wireless LAN, high-speed Net access a potent combo

By David Tanaka

Our home computing experience has taken a turn for the better since we installed Bell's Sympatico High Speed Internet service and Diamond Multimedia's HomeFree wireless LAN. When our main computer, located in a third-floor spare bedroom, is occupied—which is almost always—I can take my portable and wander to any room in the house and still have access to the network and the Internet. All this is accomplished without being tethered to any network cabling, or having to plug a modem into the phone line.

Bell Sympatico High Speed Edition Internet access service
Kit prices: $49.95 (for desktop PC) to $199.95 (for portables. Includes installation)
All kits include Ethernet card and cabling
HSE subscription: $39.95 per month
1 Mbps modem rental: $14.95 per month
Diamond Multimedia HomeFree wireless network kit
Estimated price: $300-$350 (for two wireless network cards and software). US$99 (each extra PCI or ISA card). US$129.95 (each extra PC Card)

There are two systems that make this happen: a high-speed Internet service and a wireless network. Although we are talking about specific products in this article, you should be able to achieve the same end with similar products and services from other companies.

Bell's Sympatico High Speed Edition (HSE) was introduced in Toronto, Ottawa/Hull, Montreal and Quebec City in December 1998. It is an ADSL (asymmetrical digital subscriber line) technology using the phone wire already present in homes as a conduit for high speed data communication. Because ADSL uses a different frequency band, a person can access the Internet with the ADSL modem and have a conversation on a regular telephone handset at the same time, using a single phone line.

The Sympatico HSE was met with some criticism when it was launched, mainly because of Bell's decision to use "one-meg" DSL modems, which cap the download bandwidth at 1 Mbps. Although this is theoretically more than 15 times faster than a 56Kbps modem, it is far short of the multi-megabit per second data rates ADSL is capable of—again theoretically. For example, last fall, TCP's senior editor Graeme Bennett tested BCTel's Multimedia Gateway ADSL service, which offers download speeds of up to 4 Mbps. Theoretically, ADSL offers speeds of up to 6 Mbps downloading (the Internet to you) and 640 Kbps uploading (you to the Internet).

Despite the fact that Bell's Sympatico HSE falls far short of 6 Mbps, in actual use we're finding the HSE service to be fast enough for what we want to do on the Internet. For example, we've downloaded files of around 2 MB on several occasions in less than a minute. And although we've not made any attempt to quantify this, the speed seems available most of the time. With the cable modem service we'd previously subscribed to, but could no longer get when we moved to a different neighborhood, Internet access would sometimes slow to a crawl.

That's not to say the Sympatico HSE has been troublefree. There seem to be times when browser performance slows as it tries to find the Sympatico Bellglobal server. And during the first three weeks with HSE, we experienced one day in mid March where the service seemed to shut down altogether. A call to the Sympatico help desk confirmed our suspicions that the service was experiencing "technical difficulties."

On the whole, however, once you've experienced a high-speed Internet service, it's difficult to go back to dial up. With both DSL and cable modems, you do not have to dial up each time you want to access the Internet. You are online each time you launch a browser or email software. That convenience is hard to beat. With speed, there is a definite issue with actual performance versus advertised performance, but when the bandwidth is there, it is a pleasure to use.

Diamond Multimedia's HomeFree wireless network makes my list of top 10 nifty products of 1999, but with an important caveat. In a nutshell, HomeFree creates a wireless LAN connecting the computers you have in your home without the need to drop special Ethernet cabling. It also allows you to set up one of the computers as an Internet server, thereby giving all the other computers on the LAN access to the Internet. When coupled with a high speed Internet service, it provides instant Internet access from anywhere in the home. (The caveat is that if you have a portable that you use on a network at work, you may have problems setting the portable up on the HomeFree network.)

After setting up HomeFree and the Sympatico HSE service, I was able to wander freely about our three-level townhouse with a portable computer and access the Internet, print remotely, transfer files between computers, and install software across the wireless LAN using the CD-ROM drive on another computer.

There have been other small conveniences as well. When we came across a movie on TV that we didn't know anything about, we simply picked up the notebook PC, ran an Internet search on the movie title and found a synopsis, the cast list and several reviews. As I was listening to some music by a '70s folk singer, a search on the Internet revealed a complete discography, the singer's biography and a list of other artists who have covered his songs. And I didn't even have to get off the couch. This is home computing as it should be.

Both the Diamond Multimedia HomeFree system and the Sympatico high speed Internet access service were moderately easy to install. If you can install a modem, network card or sound card, these products should not stump you. I set up the Sympatico service first, and then about a week later, the HomeFree LAN.

Setting up Sympatico HSE

Sympatico offers four starter kits: Two do-it-yourself kits (for desktop or portable computers), and the same hardware options that a Bell technician will install for you for $50 more.

Sympatico sent me a do-it-yourself desktop kit, which retails for $49.95. It includes an ISA network card, a 1 Mbps DSL modem (with a separate power supply, which is also included), a telephone line filter and Ethernet and telephone cable. Setting up involved installing the network card and the drivers, and routing the cables to the correct ports. The 1 Mbps modem has an Ethernet jack and a phone jack. Phone wire goes from the telephone wall jack to the modem, and Ethernet cable goes from the modem to the network card in the PC. Once you've plugged in the AC adapter and powered up the modem, the physical preparation is done.

The supplied Ethernet card comes with drivers on a diskette. Windows 98 recognized the card and installed the driver after prompting us to insert the driver floppy. Sympatico comes with a software installation kit, which installs Netscape Navigator and makes the proper settings to allow access to the Internet through the 1 Mbps modem.

However, since we were using Windows 98, we chose not to use the installation kit. Instead, following the instructions provided by Sympatico, we made just one change to the Internet Explorer settings (over riding the automatic server configuration setting by providing a specific URL for the HSE server) and we were online.

When we tried to make a phone call while surfing the Net, we detected a moderate level of line noise. But this was eliminated by plugging in the line filter included in the HSE kit.

Setting up HomeFree

Once we had the Sympatico HSE working, we turned to the Diamond Multimedia product. We were quite interested in this because the advertising literature said HomeFree also included software that allowed Internet access for multiple computers using just a single connection to the Internet.

Diamond Multimedia offers a couple of variations of the HomeFree kit: one includes an ISA and a PCI network card for use in two desktop computers, while another includes an ISA network card and a PC Card (PCM

Continued on page 26

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10/100MB HuB

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IBM Netfinity servers

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Processor	• **Celeron 333**	• **Celeron 333**	• **Pentium II 350 Mh**
Cache	• 128K Integrated	• 128K Integrated	• 512K L2
Memory	• 32MB SDRAM PC 100Mhz	• 64MB SDRAM PC 100Mhz	• 128MB SDRAM PC 100Mhz
Hard Drive	• 3.2GB Ultra DMA	• 8.4GB Ultra DMA	• 10.1GB UDMA 7200RP
CD/DVD Rom	• 36X EIDE ROM	• 48X EIDE ROM	• Hitachi DVD-ROM III
Video Card	• Integrated 64Mb 3D AGP w/8MB frame buffer	• ATI AGP Xpert 98 w/8MB	• Creative AGP 3D Blaster RAVA TNT 16MB
Monitor	• •	• Opticquest Q71 17" 1280x1024 .27mm	• Mitsubishi DPlus 70 17" 1280x1024 .25mm
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Satellite	4010CDT	PII 266	32MB	3.8GB	[illegible] TFT	24X		[illegible]
Satellite	4020CDT	PII 300	32MB	[illegible]	[illegible]	24X		[illegible]
Satellite	4030CDT	Celeron 300	32MB	[illegible]	[illegible] TFT	24X		[illegible]
Satellite	4060CDT	PII 333	64MB	6.0GB	14.1TFT	24X		[illegible]
Portege	3010CT	P266	32MB	4.3GB	[illegible] TFT			[illegible]
Portege	3015CT	P300	32MB	6.0GB	[illegible] TFT			[illegible]
Portege	7010CT	PII300	32MB	4.3GB	[illegible] TFT			[illegible]
Tecra	8000	PII266	32MB	5.0GB	12.1TFT	24X	56X	[illegible]
Tecra	8000	PII300	64MB	6.0GB	13.3TFT	24X	56K	[illegible]
Tecra	8000	PII300	64MB	8.0GB	14.1TFT	24X	56K	[illegible]
Tecra	8000	PII 300	64MB	8.0GB	14.1TFT	DVD	56K	[illegible]

IBM

Model	CPU	RAM	HDD	Display	CD	Modem	Price
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[illegible]	P200	64MB	[illegible]	[illegible] TFT	24X		[illegible]
[illegible]	PII 266	[illegible]	[illegible]	[illegible] TFT	20X		[illegible]
[illegible]	P266	32MB	[illegible]	12.1TFT			[illegible]
[illegible]	PII 266	64MB	[illegible]	12.1TFT			[illegible]
[illegible]	PII300	32MB	4.1GB	13.3TFT	24X		[illegible]
[illegible]	PII266	64MB	[illegible]	13.3TFT	20X		[illegible]
[illegible]	PII266	32MB	[illegible]	14.1TFT			[illegible]
[illegible]	PII300	128MB	[illegible]	13.3LCD	DVD		[illegible]

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Armada	4100	PII 266	16MB	[illegible]	[illegible]			[illegible]
Armada	7400	PII300	32MB	[illegible]	[illegible]	1X		[illegible]
CTX	[illegible]	[illegible]	32MB	2.1GB	12.1TFT	[illegible]	[illegible]	[illegible]
CTX	[illegible]	PII 266	[illegible]	[illegible]	13.3TFT	[illegible]	[illegible]	[illegible]
ALER	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
ALER	[illegible]	PII 266	64MB	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

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—	Creative PCI AWE 64 3D Sound	—
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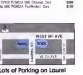

Lots of Parking on Laurel

Surfin' all through the house

Continued from page 21

CIA) wireless network card for use in portable computers. This is the one we received.

The cards themselves look like network cards except for the small protruding stub in place of a cable port. The cards use a 2.4 GHz radio frequency signal and spread-spectrum frequency hopping for security. The devices will work at separations of up to 45 m (150 ft.), will communicate through walls and floors, and have a datacomm speed of 1 Mbps.

The installation procedure is straightforward but quite specific. If you want other computers on the wireless network to share Internet access, you must choose which computer will act as the Internet server and install the HomeFree software on it first. The installation program installs the wireless card driver and asks you which network card you want to use to access the Internet (we merely selected the one connected to the DSL modem). You then install the wireless card drivers and HomeFree software on the rest of the machines that comprise the LAN.

An old 486 ThinkPad Butterfly subnotebook we have seemed to be an ideal client for this network. It is a little underpowered, has no CD-ROM drive and a broken floppy drive so adding new software is problematic. However it is light, compact, has a decent screen and otherwise works fine. Using another portable with a CD-ROM drive we copied the HomeFree installation files to a 20 MB memory card and installed the software from the memory card inserted into the Butterfly's PC Card slot.

In order for the network software to recognize and give unique identifiers to each computer on the network, all of the computers have to be on and in a "polling" state when a new computer is added so that it too will be uniquely identified. Diamond says you can have as many as 16 computers on a HomeFree LAN.

Once the installation was complete, I took the Butterfly to the second level, then to the first level of our house and was quite impressed to see that both the LAN and Internet were still accessible from the portable. I took the opportunity to add Microsoft Works 4.5 to the floppy-less, CD-less portable by accessing the desktop PC's CD drive over the wireless LAN. Yes, it was slow but it worked.

Once lucky, twice cursed

One might think HomeFree could be a good solution for a telecommuter who carts a notebook computer to and from work, and would benefit from high speed Internet services from home. To test the practicality of this I also installed HomeFree on the notebook I use every day—one that already has network settings for the company LAN.

This proved to be much more complicated. I did eventually get it to work, and while the wireless LAN portion seems stable, Internet access from this machine is sporadic. A Diamond Multimedia spokesperson said HomeFree is aimed specifically at the home computing market, and was designed with the assumption that home computers are not on an existing network. When we filed this story, we were still trying to isolate the reason why Internet access was an intermittent service over the wireless LAN.

Is it worth it?

Wireless access to the Internet and to other computers on a LAN has proven to be the height of convenience. I personally feel it is worth the premium price. The Sympatico HSE service costs about $55 per month, $39.95 for the service and $14.95 for the modem rental, although the company is waiving the modem rental fee for another month (until the end of May). The cable companies have reduced their rates to under $40 in most parts of the county where cable modem service is available.

However, the Sympatico HSE has not been rolled out consistently across the country. The one we tested is being offered by Bell Canada in Ontario and Quebec. Although all the regional telcos offer the Sympatico brand, not all offer a residential high-speed Internet service.

The HomeFree system is also somewhat more expensive—and at 1 Mbps, slower—than an Ethernet LAN. As a comparison, 3Com has a home networking kit called the OfficeConnect Networking Kit, which sells for under $200. It consists of two network cards and Ethernet cabling.

Anyone concerned about the effects of radio frequency electromagnetic fields on humans might worry about using these devices in the home. This issue has been studied for a number of years, and at this point, organizations like the Institute of Electrical and Electronics Engineers (IEEE) have set standards and say that equipment built within these standards are safe. ❑

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Home networking via the phone line

HomePNA products make LAN-at-home easy and practical

By Rod Lamirand

The home network is upon us. Until recently, having more than one computer at home was a clear sign that it was time to get a life! If your second machine was a portable you were okay, but two or more desktops was over the top.

That's changing and fast. Parents with teens, young guys or gals sharing a house or apartment, couples with a home office—all are finding themselves with two or more computers in the home. Once you have more than one computer it only makes sense to network them. The benefits are many: sharing a printer or removable storage device, moving files back and forth, multi player games, even surfing the Internet from two computers using one modem and one Internet service provider (ISP) account.

Paths to the mountaintop

There are many ways to reach the top of a mountain. Similarly there are a number of technologies you can use to network your home. Recent work by the HomeRF Working Group and the Home Phoneline Networking Alliance (HomePNA) have resulted in home networking based on radio frequency (RF) technology and using existing telephone wiring.

The HomePNA includes IBM, Lucent, Intel, and Rockwell, among others, and has set up standardized protocols and expectations for HomePNA certified products.

The HomeRF Working Group has more than 60 members, including IBM, Intel, Microsoft, Epson, Diamond and many other computer product manufacturers whose names would be familiar to readers of *The Computer Paper*. HomeRF has been working on a standard called SWAP (shared wireless access protocol), which would help ensure all PC and consumer electronics devices would be able to communicate with each other.

There has also been ongoing development of products that use the household electrical wiring as a data conduit.

And, of course, you can always pull regular network cables through your walls—and some people do. It is a good plan, if you can do it, or if you are building your own home. Running conduits is better still, as you will inevitably want to use different wires than the 10Base-T, FireWire, or other cables that you originally installed.

For most of us, the real solution is likely to be one that doesn't involve adding more wiring to our homes by drilling holes and crawling though the dark recesses. After all, the crawl space or attic is supposed to be for things that crawl.

RF systems work by having a small transmitter/receiver on the network cards attached to your computers. The signals can pass through walls and floors and have a range of about 50 to (165 ft.). Home networking systems that use the electrical wiring in your home plug into a regular electrical outlet to send and receive data from any other point between you and the transformer that likely sits on a telephone pole on your block. Phone line systems use a standard phone line jack to connect a modified Ethernet card to your phone line. This means you can connect to other computers wherever you have a phone plug installed.

Two phone-line based home networking products

Both Home PC Link Kit, from Best Data, and HomeFree Phoneline, from Diamond Multimedia, are products that use your standard telephone lines to connect up to 25 PCs. The products are both based on the HomePNA network standard although only the Best Data product carries the HomePNA-compatible logo.

HomePNA products, like the two reviewed below, currently enable a 1 Mbps LAN (local area network) of up to 25 devices that can run concurrently with telephone voice or fax calls with no noticeable effect. The HomePNA claims the technology will work in 99 percent of North American homes. Computers on the LAN may not be more than 150 m (500 ft.) apart. The systems use software, an Ethernet-like PCI card for each computer, and telephone wires to connect the card to the wall.

How I tested

I tested these products in my home office. I have a new Pentium III-based PC and an old 200 MHz Pentium system (both engraved and tethered, and the house alarmed—which I advise everyone to do!). My telephone line is not the best—I know, because I installed much of it.

When I moved into this old starter house there was only one phone line jack. I spent an afternoon that first summer in the dark, spider-filled recesses of my crawlspace, stapling telephone wire to the beams and then snaking it up through hastily drilled holes. The wire was in fact meant for use in a home alarm system but it was free so I used it. I picked up three little outlet connectors, or whatever they are called, but needed a fourth so I used an old rusty one I found. And yet both systems worked perfectly with this wiring.

As a further challenge I tried running my mini-LANs through two 7.5 m (25 ft.) telephone wire extension cords. That way I could test different phone plugs without having to physically move either computer. Lastly I also tried the systems by simply running the telephone wire from one machine to the other without going through the phone lines. In the end I found no degradation of transfer speed in any configuration.

I also transferred files from machine to machine while making a phone call and found there to be no loss of transfer speed. Of course, a 1 Mbps transfer speed is not very fast, but it is sufficient for the needs of most home PC users. I listened for any sounds during the call and could hear none. I also played various multiplayer games without any problems. Finally I ran the browsers on both machines at the same time using one modem and found surf speeds to be normal. I didn't do simultaneous file downloads but I suspect the results would be the same as opening two browsers on one system and simultaneously downloading files.

HomeFree Phoneline Desktop Pac
From Diamond Multimedia Systems Inc.
150-3112 SE Stonemill Dr. Vancouver WA 98684
Tel 360-604 1400 http://www.diamondmm.com
Estimated retail price. $150.99

The HomeFree Phoneline Desktop Pac from Diamond Multimedia Systems consists of two identical PCI cards, software and a couple of telephone cords. Diamond also sells a Single Pac with just one card for connecting additional computers. The minimum requirements for a HomeFree LAN are 486/33-based systems running Windows 95 or 98, with 8 MB RAM, 10 MB free hard drive space, a free PCI card slot in each machine and a CD-ROM drive of course.

Before you install the cards you must decide which machine is going to be your Internet Sharing machine. This means that you cannot access the Internet from the second machine unless the designated Internet Sharing machine is on (or you wouldn't be able to access the modem). Once you have made this decision, you install the software on the Internet Sharing machine first.

Installation and setup went fine after the usual "little tiny things that stop you dead" problems were fixed. In this case, the little tiny things were

Continued on page **37**

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Home networking via the phone line

*Continued from page **28***

1. I won't bore you with the details, but I couldn't get to the startup screen (it was not a short between the ears on the part of this user, I can assure you of that)
2. My second machine would only recognize the card as "a non-Plug and Play multimedia card" rather than the Ethernet card it really is. Trying the card in another slot solved this glitch. It could be that whoever installed it the first time (OK it was me) might not have set it all the way in.

Once over these hurdles, the setup was easy, and within a couple of minutes I could suddenly pull files from one machine to the other. The experience was a real pleasure. No this wasn't a 10 or 100 Mbps LAN but with no fuss and little hassle I retrieve things from my old machine without using floppies, Zip or Jaz disks. And not having to setup another modem or printer—that is cool.

You do have to assign your hard drives and various other devices as shared but the included program makes it plain simple.

I was afraid that the Internet connection was going to be difficult but I was wrong. The included WinGate software makes it as simple as telling the second machine you already have an ISP. After that, when you launch your browser a dialogue box pops up on the other computer, and if you have Connect Automatically checked off, your browser dials up. If you go onto the Internet Sharing PC and launch its browser everything proceeds completely normally.

Here are a few other points about Net sharing:

- You can only have up to three machines access the Internet this way before you have to purchase an upgraded WinGate licence.
- When you are sitting at the Internet Sharing PC and someone is surfing from the other PC, you can click on a small icon in the tray, and watch the addresses they are visiting.
- For some reason I haven't yet discovered, the WinGate software tries to logon to the Net on boot. If I deselect Connect Automatically from my Dialup profile, I then need to walk to the Internet Sharing PC and manually click Connect before I can surf from the secondary machine. Not a big deal and probably something I can fix.

The HomeFree Phoneline Desktop Pac comes with Unreal, a Doom-like multiplayer game from GT Interactive. The game works fine (as did Microsoft's Age of Empires) with only one little difficulty—my eight-year-old daughter won't shoot at me, and won't play if I try to shoot her.

Considering the ease of setup and the price of about $160, this product is a no-brainer for most home settings.

Home PC Link Kit
From: Best Data Products Inc
19748 Dearborn St. Chatsworth CA 91311
Tel: 818 773-9600 http://www.bestdata.com
Estimated retail price: $224.99

Also quick out of the gate with its home networking product is Best Data. Best's Home PC Link Kit costs more than the Diamond product but offers more as well. In many ways the products are the same. They both use the HomePNA standard, which means, for one thing, you should be able to buy an additional card from either vendor. I did not test this and the Diamond product box does not actually have the HomePNA logo on it, but that is the whole point of creating a standard. Both products use the WinGate software to automate the setup of Net sharing. Both allow you to access devices, such as a

*Continued on page **40***

HomePNA tops 60 members

SAN RAMON, Calif. (NB)—The Home Phone Networking Alliance (PNA) of member companies has now topped the 60 mark. The technology group's expansion has soared in recent months, officials said, as no fewer than 30 more firms have climbed on the bandwagon since the beginning of the year.

As reported last summer, Intel started the ball rolling with HomePNA technology, which works across phone lines, enlisting support from 11 major industry players.

Alongside Intel in the HomePNA alliance are Advanced Micro Devices and National Semiconductor. As with Intel, these other two chip manufacturers are looking for HomePNA chipset sales.

That Home PNA technology is actually a stripped down version of the IEEE 802.11 Ethernet standard, working at around 1 Mbps.

The technology allows end users to exchange data, play games interactively, and share high speed Internet access, across existing home phone lines although the "reach" of the system is solely within one home, so home users must have two or more PCs to use the technology.

The non processor members of the HomePNA alliance are 3Com, Compaq, IBM, Lucent, Rockwell and Tut Systems.

HomePNA chairman, Cyrus Namazi, is pleased by the alliance's recent membership increase. "Our solid growth is a tribute to the home networking industry. It demonstrates our understanding, both as an alliance and individual members of the value in developing a standards process that benefits the consumer and ultimately the industry as a whole."

Among the most notable firms joining the alliance over the last three months are Ardent Technology, DataPath Systems, Farallon Communications, Gateway 2000, PairGain Technologies, Peracom Networks, TDK Semiconductor, Xircom, and Zoom Telephonics.

HomePNA, http://www.homepna.org

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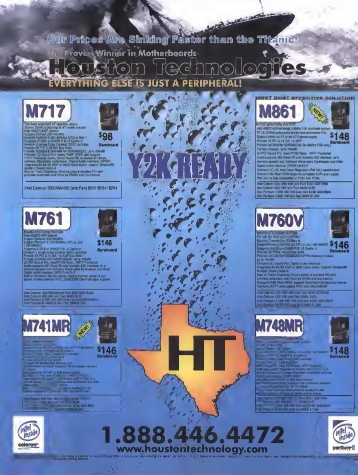

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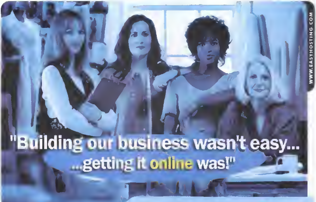
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Want a network? Try the AC socket

By Geof Wheelwright

If you have been using computers for a while chances are good that you have more than one in your home. And yet it is inefficient and expensive to buy a new set of peripherals every time you get a new computer in the house. That's where a home network comes in. A network allows all the computers in your house to share printers, files, CD-ROM drives, high capacity storage devices (such as Zip or Jaz drives), and even high-speed Internet access.

The business of connecting up the cables and network cards traditionally associated with office networks, however, is definitely not an ideal solution for the home. Typical Ethernet networks designed for use in office environments do not map particularly well to the average house. If you have ever had your spouse ask "Why does that ugly cable have to be there?" or have thought that yourself, you'll understand this dilemma.

One useful solution comes in the form of a network based on the existing wiring in your home—for both the telephone line as well as your household electrical wiring. Using the electrical system, in particular, means you can instantly create a network in almost any home. Although this idea is not new, it does look like it has finally come of age, both in terms of performance and ease of use.

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Vendors step up to the socket

A number of competing players have moved into this market, including U.S.-based Enikia, Adaptive Networks and Intelogis. Enikia is probably the most ambitious of the three and was one of the first to promise full networking speeds of 10 Mbps over the AC wiring in the home.

Enikia is a member of the Home Application Programming Interface (Home API) Working Group. Home API is made up of computer and electronics companies that are working together to develop a common programming interface for computer control of home devices.

Home API claims to ease the development of home-automation software and facilitates the accessibility of home devices by multi-vendor applications. The group says its goal is to accelerate the development and deployment of computer-controlled home devices including consumer electronics, security, lighting and temperature control systems.

"We envision wired and wireless networks co-existing in a house and this allows people to use dedicated wiring, phone line, wireless or Enikia's power-line solution, based on the capabilities they want in their network," enthuses Enikia co-founder Bob Dillon. "It's exciting to have very different devices appear as if they are seamlessly connected."

Well, Enikia sounds great—but the company has yet to ship its products and Home API is still little more than a goal and a set of specifications.

The same cannot be said of Adaptive Networks, although it currently offers a more modest range of powerline-based networking products than Enikia is promising. The products, including chip sets, modules and stand-alone units, incorporate spread spectrum technology that it claims will enable reliable data communications over all types of power lines. Speed, however, is only 115Kbps—about twice what you get from a standard 56Kbps modem and about 100 times slower than a network connection.

If you want to be able to go out and buy a network based on your existing in-home electrical systems, you'll need to look at the third supplier we mentioned, Intelogis Inc., which produces something called the PassPort Plug In Network.

It is a system for creating a network in existing in-home electrical wiring that is on sale now (at a price of US$149.99 after a US$50 rebate) and claims speeds of up to 10 Mbps. It comes with adapters to connect two computers and one printer. (The company sells additional PassPort PC and PassPort Printer Plug-In adapters for US$79.99 and US$59.99 respectively.).

To install the PassPort Plug-In Network, you just plug some adapters into your electrical outlets, then connect those to either a printer or a computer via the parallel port. You then install Intelogis' network software on any PCs that are connected to the network and you should be ready to print, share files or any other resources.

While we were not able to get hold of these units in time for this review of electrical outlet network options, it is fair to say that the configuration of the solution seems to offer a lot to many home users. To start with, it doesn't require the use of a network card (thus eliminating the nasty business of opening up your computer, finding a free slot and getting Windows 95 or 98 to recognize the card) or any network hubs. All those tasks are handled by the electronics in the PassPort Plug-In Network boxes and the bundled software. The bundled software also includes utilities that allow you to share a single Internet connection (particularly useful in a house where you have a dedicated Internet connection from a cable modem).

Background

The electrical socket has long been coveted by home networking

Continued on page 40

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Home/ Office Essential

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104 (Windows 95) Keyboard
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Fujitsu 1.44MB 3.5" FDD
AGP 3D 8M Video
15" N.I L.R SVGA Monitor
104 (Win 95) Keyboard
15" Tower w/ 250W P/S
2B Mouse + Pad
Acer 36x U-DMA CD-ROM
3D Stereo Sound
100W Stereo Speakers

Financing Available
32MB 4.3GB
15" SVGA Monitor
8M AGP Video

P-II-350 **998** $35/mo*
P-II-400 **1168** $40/mo*
P-II-450 **1488** $52/mo*

3-year service & 1-year parts warranty

Options: Windows 98 +$130 / 6.4G HD (from 4.3G) +$30
Acer 56K V.90 V/F Modem +$66 / PS/2 & USB Adapter +$10
64MB RAM (from 32M) +$60 / 17" .27 SVGA Monitor+$130

CPU/RAM

30pin 1M / 4M True Parity	$2/10
72pin EDO 4M / 8M	$15/22
72pin EDO 16M(2x8)/ 16M(4x4)	$48/48
72pin EDO 32M(4 chip)/ 32M(16 chip)	$88/98
72 pin Reg 4 / 8 / 16 / 32M	$15/30/55/110
72 pin Parity 8 / 16 / 32M	$40/65/120
PC100 SDRAM 32 / 64M	$60/112
PC100 SDRAM 128 / 256M	$220/500
ECC PC100 SDRAM 64 / 128M	$150/288
AMD CPU	
K6-II-300 / 333 / 350	$98/108/125
K6-II-366 / 380 / 400	$150/168/218
Intel CPU	
Celeron 333 / 366 / 400	$118/155/220
P-II 350 / 400 / 450	$268/418/718
P-III 450 / 500	$748/1048

Motherboards

Pentium / K6-II Motherboard	
Asus P5A / P5A-A AGP / ATX	$138/148
Asus P5A-B / P5A-B-A AGP / AT	$128/138
Vigor (Super 7) AGP / AT	$98
P-II / P-III Motherboard	
ABIT BH6 / BX6	$158/188
Asus P2B (440BX) / P2B-F	$168/198
Asus P2BS w/ U2W SCSI	$478
Asus P2BDS Dual/ U2W SCSI	$668
Gigabyte GA6BXC 440BX	$155
Intel SE440BX2	$138
Intel T440BX / SCSI	$480
Intel N440BX Dual / U2W SCSI	$770
Vigor 440ZX	$128

Drives & Controllers

Fujitsu	
3.2 /4.3/6.4 /8.4/10.2G	$156/175/198/218/288
IBM	
10.1/ 18G U-DMA 7200 rpm	$348/598
4.5 / 9G UWSCSI	$328/528
9 / 18G U2W SCSI	$628/1098
Maxtor 8.4 / 13.6 / 17.2G	$218/328/438
Quantum	
EX 6.4 / 10.2 / 12.7G	$160/248/328
CR 4.3 / 6.4 / 8.4G	$188/218/238
Viking II 4.5 / 9.1G U2W	$380/558
Atlas III 9.1 / 18.2G U2W	$638/1098
Seagate	
Barr 9 / 18G U2W SCSI	$518/1178
Cheetah 9 / 18G U2W SCSI	$828/1488
Western Digital (U-DMA)	
6.4 / 8.4 / 10.2 / 13G	$208/228/268/338
9 / 18G U DMA66 7200rpm	$308/548
Adaptec (SCSI Adapter)	
1505 / 2910 / 2920	$70/130/180
2940U/ 2940UW/ 2940 U2W	$255/298/498
TekRam 315 / 390 SCSI Adapter	$68/85

Video Conferencing

Intel Camera Pack USB/PCI	$198/248
Logitech VC USB camera kit	$118
Logitech QuickCam Pro Para/ USB	$168/138
USR BigPicture Video Kit	$218
Toshiba Camera & Capture card	$178
Video Capture & TV Tuner	$95

CD Writers

HP 7200i/8110i Int. IDE	$278/398
Panasonic 8x4 Int. IDE / SCSI	$308/328
Yamaha 4416 Int. IDE	$408
Yamaha 4416 Int. SCSI / Kit	$438/478
Yamaha 4416 Ext. SCSI Kit	$638
BASF/Sony CD-R (10pc)	$18/25
BASF / Sony CD-RW	$12/22

CD / DVD / Sound

Acer 36x / 40x CD-ROM	$68/75
Asus/Creative 40x CD-ROM	$82/85
Panasonic / Toshiba 32x CD-ROM	$70/80
Pioneer 36x SCSI CD-ROM	$138
Creative Encore DVD (6x) kit	$338
Hitachi / Sony DVD II (5x)	$150/138
Pioneer 6x DVD IDE / SCSI	$178/218
Sigma DVD Controller PCI	$138
Acer 3D Wave PnP Sound	$20
SoundBlaster 16/3D / PCI 128	$38/60
SoundBlaster [illegible] value	$88/85

Modems

Acer Supra 56K V.90 Voice/Fax PCI	$68/70
USR 56K V.90 Voice/Fax Int/PCI/ ISA	$78/118
USR V.90 Ext. / w/ voice	$198/258
USR ISDN 128K Int	$288

Tape Backup

HP 5GB Int. / Ext.	$250/320
HP 8GB Int. / Ext.	$300/390
Iomega Ditto Max 7G Int./Ext.	$278/328
Iomega Ditto Max 10G Int./Ext.	$428/448

ZIP / JAZ / LS120

ZIP 100M Int. IDE	$108
ZIP 100M Ext. Para / SCSI	$168/182
ZIP Plus 100M Ext. Para / SCSI	$238
ZIP 250M Ext Para / SCSI	$278/278
ZIP 100M / 250M Disc	$13.80/32
JAZ 2G SCSI Int. / Ext.	$468/498
JAZ 1G / 2G Disc	$118/132
JAZ SCSI to Parallel Adapter	$88
LS120 Super FDD Int. / Ext.	$128/208
LS120 Disc	$13.80

Spkr/ Mice/ KB/ Cases

Speaker	
100W Stereo/ GNT 5000A Subwfr Kit	$16/68
Altec ACS44/45.1/48/ADA305	$85/125/188/238
Creative PCworks/FourPointSurround/Microworks	[illegible]
Yamaha M15 Spkr/ M10 Subwfr	$78/128
Mouse	
Logitech 2B/ 3B/ wheel mouse	$13/18/20
Logitech mouseman 4B / mouseman+4B	$68/78
Logitech Trackman Marble / FX	$88/118
MS Intellimouse / USB	$38/68
Keyboard	
Acer / Mitsumi 104 Keyboard	$13/15
Fujitsu 8725/4725 KB	$20/55
Logitech Cordless KB & Wheelmouse	$132
MS Natural Keyboard / USB	$48/ 75
Case & Fan	
AT 15"/18" Case & P/S	$40/50
ATX 17"/19" Case & P/S	$60/65
Removable HDD Drawer	$28
External HDD/CD-Rom Holder	$80
Slot Fan / HDD Fan	$15/18

Printers

Color Printer	
Canon 250 after $40 Rebate	$108
Canon 4400 / 5000 / 7000	$188/350/460
Epson 440/ 640/ 740/ 850	$208/278/380/510
Epson 850N/ 1520/ 3000	$738/738/1788
Epson Photo 700/ Photo EX	$388/578
HP 695C/722C/895C	$230/348/530
HP 1120C/2000C/2000CN	$650/888/1418
Lexmark 7[illegible]	$228
Laser Printer	
Brother 1020/ 1040DX/ 1050DX	$370/428/530
Brother 1060/ 1660E	$680/1138
HP 1100 600dpi 8ppm 2M	$568
HP 2100 10ppm 1200dpi 4M	$1038
HP 2100M / 2100TN	$1168/1448
HP 4000/4000N/4000TN	$1838/2098/2368
HP 5000/5000N/5000GN	$2098/2998/3638
HP 8000/8000N/8000DN	$3258/3608/4308
HP 8100/8100N/8100DN	$3868/4338/4998
HP 4500/4500N Color Laser	$3868/4338
HP 8500/8500N Color Laser	$8898/9738
HP OfficeJet 1170C Color Print/Scan/Copy	$1028
HP LaserJet 3100 Laser Print/Scan/Copy	$1098
Lexmark Optra E / E310	$318/588

Scanners

Acer 620P / 620U (USB)	$108/138
AGFA Snapscan 1212P/ 1212U	$178/138
Canon 320P / 620P (350/680)	$88/188
HP 4100C USB / 5100C	$248/388
HP 5200C USB	$378
HP 6200C / 6250C USB & SCSI	$518/598
Mustek 1200 LS SCSI	$138

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Ten-Users-on-One-Modem-to-Internet

3com Office Connect 56K Lan Modem provides multi-user internet access, LAN and Internet connectivity for an entire office

- 4 Ethernet Ports (expandable to 10 users with an external 8-port hub)
- one IP Router
- one pass-through voice port
- security software
- one analog connection

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Intel Celeron Upgrade

- Intel Celeron 333/366/400MHz / 128K
- P-II PC100BX Pro M/B
- AGP 3D 8M Video • 3D Stereo Sound

C-333	C-366	C-400
$268	$318	$388

Intel Pentium II Upgrade

- Intel P-II 350 / 400 / 450MHz / 512K
- P-II PC100 BXPro AGP M/B
- AGP 3D 8M Video • 3D Stereo Sound

P-II-350	P-II-400	P-II-450
$418	$568	$868

Options:
32/64M SDRAM +$60/112 • 3.2G U-DMA HD +$165
ATI 3D AGP Video 4/8M +$56/80 • 56K V.90 Modem +$56

Monitor

Acana 15" / 17" 27	$168/308
Preview 15" / 17" / 19"	$192/308/590
Mitsubishi DP70 / DP72	$648/738
Mitsubishi DS90E / DP900U	$936/1098
NEC 15" A500 / E500 / M500	$288/360/348
NEC 17" A700 / E700 / M700	$488/660/728
NE[illegible] 900 / E900+ / P1250+	$[illegible]/1458
Panasonic SL70 / PL70	$438/580
Pan[illegible] S1[illegible] 19" 25	$818
Panasonic 21" S110/ P110	$1338/1598
Sony 15" ES / GS	$368/428
Sony 17" ES / GS / PS	$598/798/898
Sony 2[illegible] GS	$[illegible]
Sony 420 GS / 400 PS	$1028/1048
Sony 520 GS / 500 PS	$1498/1928
Sony F500 / W900	$2598/3088

Video Card

S3 Virge PCI 4M	$45
ATI TV Wonder PCI	$118
C[illegible] Riva TNT 16M PCI	$138/138

AGP Video Card

[illegible] AGP [illegible]	$[illegible]
[illegible]	$[illegible]
ATI Rage 1x / Xpert 98 8M	$60/75
ATI All-in-wonder Pro 8M / 128 16M	$208/308
ATI Xpert 128 16M AGP	$155
ATI [illegible]	$[illegible]
Creative 3D Banshee 16M AGP	$138
Creative RIVA TNT 16M AGP	$138
Diamond V550 TNT 16M/OEM	$[illegible]/150
Diamond Monster Fusion 16M / OEM	$208/170
Matrox MilleniumG200 8M	$138
Matrox Mystique G200 8M	$168
Matrox Marvel G200 8M TV	$368

Viewsonic/Optiquest

Q53	15"	.28mm	1280x1024	$248
V55	15"	.28mm	1280x1024	$248
Q71	17"	.27mm	1280x1024	$368
V73	17"	.26mm	1280x1024	$468
V75	17"	.26mm	1600x1280	$538
E771	17"	.27mm	1280x1024	$398
G773	17"	.26mm	1280x1024	$468
GT775	17"	.25mm	1600x1280	$548
PT771	17"	.25mm	1600x1280	$638
PT775	17"	.25mm	1600x1280	$698
PS775	17"	.25mm	1600x1280	$649
V95	19"	.26mm	1600x1280	$738
G790	19"	.26mm	1600x1280	$748
PS790	19"	.25mm	1600x1280	$878
PT795	19"	.25mm	1800x1440	$1338
G810	21"	.25mm	1600x1280	$1338
P810	21"	.25mm	1600x1280	$1468
P815	21"	.25mm	1800x1440	$1698

Home Networking

By using existing phone line or via wireless broadcasting you can connect all computers in your house/office together without messy drilling & wiring. It provides:

- Internet access sharing
- Peripheral (printer, scanner etc.) sharing
- File sharing
- Multi player gaming
- Reliable & secure connection with speed up to 1 Mbps.

Diamond HomeFree Phoneline Pack (2 PCI Card and Software) $168

Diamond HomeFree Wireless Pack (1 PCI, 1 ISA and Software) $298

LCD PANEL / PROJECTOR

Optiquest		L700	15	$1538
Vie[illegible]	VPA	145	14.5	$1[illegible]
Viewsonic	VPA	150	15"	$1698
Viewsonic	VPD	150VC	15	$1698
Viewsonic	VG	180	18"	$4498
Sony	LCD	L150	15"	$2228
NEC	LCD	400V	14"	$1088
NEC	LCD	1500M	15	$1428
NEC	LCD	1510	15"	$2048
NEC	LCD	1810	18"	$4580
NEC	LCD	2010	20"	$6588
Mitsubishi	LCD	50		$1898

Data / Video Projector

Infocus	LitePro 400	$4296
Infocus	LitePro 425	$5896
Viewsonic	PJL 802	$4890

Mobile Solution

TOSHIBA

40[illegible]	[illegible]	32M	4G	12.1DSTN	24X		$1788
4010CDS	PII-266	32M	4G	12.1DSTN	24X		$1948
4090CDT	PII-266	32M	4G	12.1TFT	24X		$2428
4060CDT	PII-300	32M	4G	13.3TFT	24X		$2888
4000CDS	C-300	64M	4.3G	13"DSTN	24X	56K	$2568
4030CDT	C-300	64M	4.3G	13.3"TFT	24X	56K	$2998
4000XCDT	PII-333	64M	6.0G	14.1"TFT	24X	56K	$3798
4000XCDT	PII-366	64M	6.0G	14.1"TFT	24X	56K	$4488
8000	PII-266	32M	4G	12.1TFT	24X	56K	$3528
8000	PII-300	64M	7.5G	14.1TFT	DVD		$5348
8000	PII-366	64M	9.3G	14.1TFT	DVD		$6188

IBM

i-1411	P300MMX	32M	4.3G	12.1TFT	24x	56K	$2388
i-1461	P300MMX	64M	4.3G	13.3TFT	20x	56K	$2888
390Z	PII-266	32M	4G	13.3TFT	24x		$2828
390Z	PII-300	32M	4G	13.3TFT	24x		$3498
380	PII-233	32M	3.2G	12.1TFT	24X	56K	$2698
380	PII-266	64M	4.3G	14.1TFT	24x	56K	$3868
600E	PII-366	64M	6.4G	13.3TFT	24x		$5798

ACER

501DX	266MMX	32M	3.2G	12.1DSTN	20x	56K	$1798
502DX	266MMX	32M	4G	12.1HPA	20x	56K	$1898
503T	266MMX	32M	4G	12.1TFT	20x	56K	$2338
711TE	PII266	64M	4G	13.3TFT	24x	56K	$3118
712TE	PII300	64M	6G	13.3TFT	24x	56K	$3598

HP HANDHELD PC

HP 620 w/ Modem	$1378
HP 320 LX/ 16M RAM	$980
HP 660 LX/ 32M/ 56K Modem	$1198
3COM PalmPilot III / V	$428/598

Network Products Centre

10 BaseT Adapters

Acer ALN-101 ISA 10BT Combo	$25
Acer ALN-201 PCI 10BT Combo	$28
3COM 3C509B ISA Ethernet III TPO	$80
Intel PCL A8220B ISA EtherExpress Pro 10+	$85
Intel PIL A8520 PCI EtherExpress Pro 10+	$120
SMC 1660T ISA 10BaseT	$30
SMC 1208T PCI EzCard 10BaseT	$30
SMC 8416T ISA EtherEZ 10BaseT	$57
SMC 8432T PCI EtherPower 10BaseT	$57

10 BaseT Hubs

Compex 8-RJ45 + 1 BNC 8 Port Hub	$68
3COM 3C16440 SS II Entry Hub 12 Port	$298
3COM 3C16441 SS II Entry Hub 24 Port	$418
3COM 3C16405 SS II PSH Hub 40 12 Port	$718
3COM 3C16406 SS II PSH Hub 40 24 Port	$1248
3COM 3C16450 SS II PSH Hub 50 24 Port	$1348
3COM 3C16670A SS II Hub 10 12 Port	$748
3COM 3C16671A SS II Hub 10 24 Port	$1298
3COM 3C16610 SS II Dual Speed Hub 12Port	$1080
3COM 3C16611 SS II Dual Speed Hub 24Port	$1598
3COM 3C16700 OfficeConnect 8/TPO	$118
3COM 3C16701 OfficeConnect 8/TPC	$148
3COM 3C16702 OfficeConnect 16/TPC	$248
3COM 3C16704 OfficeConnect 4/TPO	$75
3COM 3C16710 OfficeConnect 8/TPM	$488
D-Link DE-805 TP/C 5 Port Hub	$75
D-Link DE-808 TC 8 Port Hub	$88
D-Link DE-812 TP+ 12 Port Hub	$206
D-Link DE-816 TP 16 Port Hub	$238
D-Link DE-824 TP 24 Port Hub	$348
D-Link DE-1812a 12 Port SNMP Hub	$650
Intel InBusiness SH10T 5 Port Hub	$72
Intel InBusiness SH10T 8 Port Hub	$93
Intel InBusiness SR10TPS Internet Station	$398

100Mbps Adapters & Hubs

3COM 3C905B-TX 10/100 PCI	$98
3COM 3C980-TX 10/100 Server Card	$190
3COM 3C16722 OfficeConnect 8 Port	$275
3COM 3C16723 OfficeConnect 4 Port	$150
3COM 3C250C-TX/12 SSII 100 12 Port	$1118
3COM 3C250C-TX/24 SSII 100 24 Port	$1880
D-Link DFE-904 Dual Speed 10/100 4 Port	$138
D-Link DFE-530TX 10/100 PCI	$36
D-Link DFE-808TX FastEthernet 8 Port Hub	$456
D-Link DFE-816 FastEthernet 16 Port Hub	$858
Intel PILA 8460 Pro100 10/100 PCI	$70
Intel PILA8470 Server Adapter	$148
Intel PILA8490 Intelligent Server Adapter	$468
Intel PILA8480 Pro 100 Smart FastEthernet	$1048
Intel InBusiness SH100TX4 4 Port Hub	$190
Intel InBusiness SH100TX8 8 Port Hub	$298
Intel InBusiness SH101TX8 8 Port Hub 10/100	$330
Intel Express 210T Stackable 10/100 12 Port	$689
Intel Express 210T Stackable 10/100 24Port	$1418
SMC 1211TX ExCard 10/100Base-T PCI	$38
SMC 9432TX Etherpower 10/100Base-T PCI	$92
SMC 9334HOT Etherpower 10/100Dual Channel	$366
SMC 5208TX EZ Hub 10/100 8 Port Hub	$249

APC Power Protection

BackUPS 200/300	$128/138
BackUPS 500M/650M	$198/298
BackUPS Pro280B/420/650	$205/335/408
BackUPS Pro 1000/1400	$550/698
SmartUPS SU420/SU620	$365/448
SmartUPS SU1000/SU1400	$728/938
SmartUPS SU2200/SU3000	$1538/2468
Professional Surge Arrest 7/Tel	$43/54
Network Surge Arrest 7/Tel	$54/65

MS Windows NT

NT Server v4.0 CD w/5 Clients Lic.	$1138
NT Server v4.0 CD w/10 Clients Lic.	$1550
NT v.4.0 Client Access Lic.	$50
NT Server v.4.0 upgrade w/5 Clients Lic.	$450
NT Server v.4.0 upgrade w/10 Clients Lic.	$810
NT Workstation 4.0 CD	$338
NT Workstation 4.0 upgrade	$198
BackOffice Small Business Server v4.0 w/5	$2098
BackOffice Small Business Server v4.0 w/25	$3388
Microsoft SMS 2.0 w/10 Clients Lic	$1598
Microsoft SMS 2.0 w/25 Clients Lic.	$2498
Microsoft SNA Server v4.0 w/5 Clients Lic.	$1698

Server/ Network Tapes

Iomega Ditto Max 7GB Int. Tape Drive	$278
Iomega Ditto Max Pro 10GB Int. Tape Drive	$428
HP 8GB Int / Ext DAT Drive	$1180/1328
HP 24GB Int / Ext DAT Drive	$1580/1768
HP T20 20GB Int / Ext Drive	$608/768
Seagate 8GB 4mm DAT Int/Ext SCSI Drive	$1048/1238
Seagate 24GB 4mm DAT Int/Ext SCSI Drive	$1398/1598
Seagate 90GB Int / Ext DAT Drive	$3498/3660
Seagate AIT 50GB Int/Ext SCSI Drive	$3550/4048
Sony SDT 5200 Int / Ext 4GB DAT	$950/1008
Sony SDT 7000 Int / Ext 4-8GB DAT	$1088/1308
Sony SDT 9000 Int / Ext 24GB DAT	$1510/1720

Network Cables

10 BaseT Cable 10/25/50/100ft	$8/15/25/39
10 BaseT Cable Bulk per ft / per 1000ft	$.30/128
Thin Coax Cable 10/25/50/100ft	$10/15/25/38
Thin Coax Cable Bulk per ft / per 1000ft	$.26/179

NoteBook Add-On's

PCMCIA CARD

Adaptec 1450B/1460B SlimSCSI Kit	$130/230
3Com 3C574-TX Fast Etherlink 10/100	$218
Viking 56K PCMCIA Fax Modem V.90	$178
Intel EtherExp. Pro100 16-PC/32-Card Bus	$218/228
Intel EtherExp. Pro 100 LAN + 56K Modem	$438
Kingston EtherX Ethernet Combo	$115
MegaHertz XJ10BT 10BaseT Ethernet	$150
MegaHertz 3CXM356 56K Win Modem	$230
MegaHertz 3CCM156B 56K Modem	$298
MegaHertz 3CXEM556T 56K Modem + 10BT	$328
MegaHertz 3CXEM556C 56K Modem + 10BT/2	$398
MegaHertz 3CCFEM556 56K Modem + 10/100	$448
MegaHertz 5290G/52900 128K ISDN	$468/520
Xircom Realport 56K V.90 + 10/100 BT	$490
Xircom Realport 10/100 Ethernet Cardbus	$210
Xircom Realport RM56 56K V.90 Mod	$200
Xircom CM56/CM56G 56K Fax Modem	$198/278
Xircom 56K Modem + 10/100BT	$450

PORTABLE CD-ROM & SOUND

Micro Solution Bantam 32X CD-ROM	$308
Micro Solution Bantam 32X CD w/Sound	$378
Micro Solution Bantam 24X CD-ROM	$350
Micro Solution Bantam 24X CD w/Sound	$420
New Media Game Jammer PCMCIA Sound	$248

NOTEBOOK MEMORY & HDD & CASE

8/16/32/64M	$50/80/120/230 & up
Toshiba 2.1/4.3/6.4GB 2.5" HDD	$285/428/518
Targus Notepac CN01/CN20	$43/32
Targus Universal CUNI/CUNI A	$85/95
Targus Platinum CPNCI/Prestige CLPI	$148/248

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1 44MB Floppy Drive
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Logitech Mouse
17" ATX Case
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New!

Pentium III Systems

Pentium III 450 CPU
64MB PC-100 SDRAM
ASUS BX Mother Board
ATI AGP Xpert98 8M
10.2GB Ultra-IDE Hard Drive
1.44MB Floppy Drive
104 Win'95 Keyboard, Mouse
17" ATX Case w/250W
Viewsonic 17" E771 Monitor
40xCD ROM, 56k fax modem
SoundBlaster 128 Sound Card
420W Speakers w/subwoofer
One month free internet

lease $57/mon
$2128

國語 粵語 日本語でどうぞ

Motherboard

EliteGroup	
P6EXP w/SoundSocket370	**$118**
P6SEP w/Sound w/AGP8M S370	**$118**
P68X-A+ PII	**$135**
Histon	
Pentium II 767 8M AGP w/Sound	$125
Pentium III 761 w/Sound	$135
Asus	
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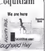

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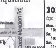

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Home networking via the phone line

Continued from page ***31***

removable storage drives or scanners, from another PC via your phone line.

Where the product differ is that the Best Data Home PC Link Kit includes a built-in 56Kbps V.90 modem on one of the cards. There are two benefits to this

1 The first is price If you don't already have a 56Kbps modem and want to install a home network, this is good value
2 Because the software knows what kind of network and modem you are setting up, there is little likelihood of conflict or other errors.

I didn't have any trouble with my external modem and the Diamond product but Best says this could be an issue

The requirements for the Best system are a little different than for the Diamond product. The Home PC Link Kit needs 100 MHz Pentium-based systems or better, running Windows 95, 98 or NT, with 16 MB RAM (in addition to the free hard drive space, PCI card slot and CD-ROM requirements of the Diamond product)

The ability to use Home PC Link with NT is interesting Multi-PC homes with a system running NT probably already have a network set up. Still, the inclusion of NT support indicates to me that Best Data intends to build for Windows Workstation 2000 (the new name of the yet-to-be-released NT 5.0). This could be very useful if other expected events take place namely the introduction of a new 10 Mbps HomePNA standard. If this happens and it is expected to this year the potential for video and other broader band applications could see phoneline networking really take off.

It is also interesting to note that the HomePNA protocol does not interfere with the various incarnations of DSL services and therefore could be used in a complementary fashion

Home PC Link Kit performed without any problems on my systems. The modem software easily set up my ISP the WinGate software easily set up my Net connections, and the network software let me configure my hard drives, printer and other devices without difficulty

The only cautions are that if you use Windows 95 you must have the OSR2 version (The manual actually recommends using Windows 98.) Also, like the Diamond product, only one user can access a single AOL (America Online) at a time But you can still have one user connecting to AOL while another surfs outside of that service

Also both products may have difficulty with programs that try to access the Internet directly outside of Windows. Some financial programs also access online services directly and may not work from the secondary computer

Impressive debuts

All in all both these early products are in a market that will undoubtedly grow and are excellent offerings. It has been a long time since I have been impressed by the launch of a new category of products. Often it takes years for anything useful and easy to use to emerge

Home networking is going mainstream and I suspect if you haven't already, you will find yourself with a mini-LAN of your own one day soon ❑

Want a network? Try the AC socket

Continued from page ***34***

pioneers. Since the mid-1980s, networking companies have been looking for ways to turn the existing electrical network in your home into a network that can carry computer data It makes a lot of sense, particularly as you can rely on every home that has a desktop computer also having electrical power. No power no computer, it's that simple

This thought struck a British company called Verran Electronics back in 1989 when it produced a home networking package using the electrical wiring It consisted of chunky gray signal boxes that you would plug into your home electrical socket Each box had a connection cable coming from it that you could then plug into the parallel or serial port of a PC or a printer.

The good news was that it worked. I used it quite extensively throughout 1989 and found it was a particularly effective way of printing documents from anywhere in the house using a notebook computer I just had to plug the gray box into the wall socket and plug the cable from the box into my MS-DOS-based computer. It would then go off and get the laser printer in another part of the house to start printing my documents

But it was slow Although the 9.6Kbps speed of this "network connection" was faster than that offered by most modems in 1989 it wasn't anywhere near as fast as a parallel printer connection directly between the computer and the printer. And networking between computers wasn't really a consideration then The network software of the day wasn't up to much more than basic print sharing and transferring of files For most uses a "sneaker net" (transferring files between computers by running from one to another with a floppy disk in your hand) was a far more reasonable proposition for moving the small text files produced by WordPerfect, Lotus 1-2-3 and dBase between computers

And so the gray box eventually died It was a product well ahead of its time And yet the ideas pioneered by Verran Electronics now appear to be living on in the products offered by Intelogis ❑

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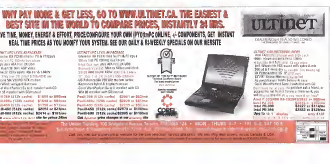

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ActionTec eases home networking

By Isie Rabinovitch

ActionLink from ActionTec is the first home networking product I've worked with. Products like this have been in the discussion stage for quite some time, but are just now starting to roll into the marketplace.

I have a personal interest in this product category, since I've had a home LAN (local area network) since 1993, based on 10 Mbps Ethernet. ActionLink runs at 1 Mbps, but it shouldn't be thought of as a slow Ethernet card. It is more than that.

ActionTec's product is one of a number that have appeared recently conforming to the HomePNA specification. Like other HomePNA products, the most appealing feature of ActionLink is that it uses the existing phone wires in your home without affecting the phone service—not in any way that I've been able to detect. It can do this because it uses a higher frequency for LAN traffic than is used for voice. In my limited but real-world testing, there were no problems. In fact, my wife was completely unaware of my experimentation, and her hearing is keener than mine.

ActionLink Home Network Kit
(Based on the HomePNA standard)
From: ActionTec Electronics Inc
http://www.actiontec.com
Estimated retail price: $120 (based on US$72 SRP)

The ActionLink Home Networking Kit for two PCs contains two small network interface cards (NICs) that are smaller than any Ethernet cards I have seen and, when turned over, look more like internal modems. The kit also includes two 1.8 m (6 ft.) telephone line cords with RJ-11 connectors, and a CD-ROM with configuration software, DynaNAT Internet access sharing software, and bonus software such as network games.

Setup requires cleanup

Installation was quite easy, although I experienced some problems that were unique to my situation. The computers I was using for my evaluation already had Ethernet cards and were configured for my LAN. The documentation indicated that the ActionLink NICs wouldn't co-exist with an Ethernet card in the same PC.

Unfortunately the documentation didn't go far enough in explaining the extent to which drivers and other software components needed to be removed. The next version of the manual will contain this information, which already exists as an internal ActionTec document.

Once I had thoroughly cleansed my computers of all remnants of my Ethernet card, things went smoothly. The installation was straightforward and appropriate for networking novices. There were no difficult, unexplained choices to make. I tried the procedure twice, once on my Windows NT Workstation 4.0 computer and the second time on my Windows 98 computer. (This kit also supports Windows 95.) There are tiny differences in the setup procedures required for each of these operating systems, but the documentation does a good job of keeping the user on course.

If at least one of the computers has a modem and a dialup networking account

Continued on page 49

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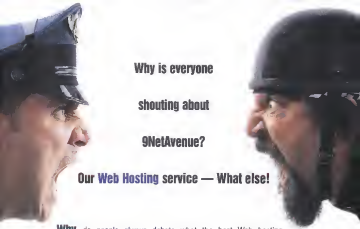

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CPUs for Pentium / PII / Pro	$[illegible]

RAM

2pin 4/ 8/ 16M EDO...	$19/24/45
2pin 32/64M/128M EDO	$83/160/380
Parity 72pin 4 / 8 /16M...	$20/32/60
Parity 72pin 32 / 64/128M	$115/130/460
30pin 1M / 4M ...	$1 /20
PC100 SDRAM 32 / 64/ 128M....	$55/100/206
ECC-SDRAM PC100 32/64/128. ...	$75/150/260
MAC DIMM 8/16/32/64M.	$25/45/85/255
SOJ Video RAM 512k/1M.........	$8/$15
SO-DIMM 72p 8/16/32M	$50/70/130
SO-DIMM 144p 16/32/64M..........	$60/80/150
RAMs for printers	available
PC100 SDRAM 256MB ECC 256MB	$680 /900

MODEMS

56k Voice Fax modem int. V.90 ISA/ PCI	$30/35
56k Voice Fax modem v.90 int	$110
USR 56k Voice v90 int PCI / ISA OEM.	$85/115
Supra 56k v.90 Voice PCI/ISA	$58/120
3COM USR 56k v.90 int/ext ...	$175/195
3COM-USR 56k v.90 Voice int/ext	$190/250
Ascend P220 Router	$2280
Cisco 250-CH + IP Drivers	$2370
Capture card & Toshiba Camera	$190
PCMCIA 56k v.90 with 100BT ...	$100/330
PCMCIA 10BT combo / 10-100BT	$90/100

VIDEO CARDS

CL5446 1M / 2M PCI	$13/21
S3 Virge 3D 4M PCI/AGP	$40/45
ATI 3D 4M PCI/AGP	$55/55
ATI 6M AGP / ATI Xpert98 8M AGP	$63/75
ATI Xpert@play 8M PCI/AGP	$120/130
ATI xpert 99 128 AGP w/16M	$150
ATI TV Tuner Wonder PCI	$110
ATI All-in-Wonder Pro 8M AGP/PCI	$210 /230
ATI Rage 128 16M/ Fury128 32M..	$190/240
Matrox G200 Mill 8M/16MB AGP	$110/190
Matrox Marvel G200 TV Kit	$370
Matrox Rainbow Runner Studio for G-Series.	$160
Monster 3D Voodoo2 12M oem	$220
Diamond V550 16M /Fusion 16M AGP	$170/140
Diamond GL1990Pro 4M/8M AGP	$110/195
Creative Banshee 8M AGP	$170
Creative TNT 16MB AGP (oem/retail)	$155/210
w/Intel i740 8M AGP	$60
3DFX Voodoo3 2000 with 16M AGP /PCI	$185
3DFX Voodoo3 3000 with 16M AGP	$245
M [illegible] 3D	[illegible]

MONITORS

SVGA14 15 17"	$16[illegible]
Acer 15" 17 (76ic 79G)	$240 380 520
Acer 17" G79 (.19 19" .25	$550/760
ADI 5P+(17") / 6P(19")	$460/680
AOC 17" .28 .26 1280x1024	$315/340
MAG XJ500T .25 15" / XJ700T .25 17"	$260/440
Mitsubishi Plus72 17"/ 900U 19"	$720/1060
NEC A500/E500/M500	$200/350/430
NEC A700/E700/E750	$470 610/665
NEC A900 E900+ /P1250....	$860/920/1500
Panasonic E50/P50/E70	$240 330 380
Panasonic SL70/PL70/SL90	$440/580/820
Panasonic S110/P110 21"	$1120/1580
Sony 100ES/GS (15")	$160/410
Sony 200ES/GS/PS (17")	$610/790/1020
Sony 400PS (19")/ 500PS (21") ...	$1120/1990
Sony F400/F500	$1490/2690
Viewsonic E655/Q71/E771	$240/370/385
Viewsonic V73/V75/G773	$490/570/520
Viewsonic PS775/P815/P817	$670/1650/1980
NEC LCD V400/1510/1510Touch..	$1380/1990/2350

NetBook ACCESSORIES

32M/64M SDRAM/EDO	$80/140
NIMH battery	$120
Li-Ion battery	$190
-Car auto adapter	$90
-AC Smart adapter (110/220V)	$110
-Toshiba 2.5" 4.0G HD..	$265
-Toshiba 2.5" 6.1G HD.	$360
-Portable Printer BJC 10/50.	$310/460
IBM 4G /6G 2.5" HD	$260/360
•PCMCIA 10BT/Coaxl card	$80
PCMCIA 100BT card	$100
•Portable Printer HP340	$380
•PCMCIA serial port/dual	$250/310
•Flash RAM card player	$150
•32bit CardBus	$185
•PCMCIA 56k faxmodem	$100
•PCMCIA 56K w/cellular	$290
PCMCIA 56k/100BT	$390
•PCMCIA 56k/100BT RealPort	$440

CONTROLLERS

IDE ISA Super IO	$10
Ultra IDE (UIDE) w/EPROM	$50
Dual UIDE PCI controler	$60
Mylex SCSI 930T (2940 scsi)	$150
Mylex UW scsi 950T (2940UW)	$180
Adaptec 1520A ISA scsi	$85
Adaptec 2940/2940UW ...	$220/270
Adaptec 2940 U2W U2W kit	$380/400
Adaptec AAA1[illegible] AAA133 kit	$500/790
Tekram DC390 / DC390U	$80/130
Tekram DC390F	$135
Adaptec APA1450 slimSCSI kit.	$115
Adaptec APA1460 slimSCSI kit..	$220
Adaptec APA1480 slim (cardbus)	$300
Adaptec 3940 Dual scsi-II ...	$550
Adaptec 3940UW Dual UW scsi	$580
Adaptec 3945 Hot Connect	$620
• Adaptec 2940 Fiber	$1100
• Jaz PCMCIA to SCSI-II adapter	$150

Monthly Specials

WD ATA66 6.4G 10G	$190/240
WD ATA66 13.3G	$295
Quantum Viking-II 9.1G U2W scsi	$530
Matrox G200 Mil AGP 8M	$110
Intel i740 8M SVGA	$60
ViewSonic PL70 1600x1280 .25 17"	$580
Canon 4400C Printer	$190
56k voice fax v.90 / USR PCI	$30/85
Abit BX6 slot 1 PII ATX AGP	$150
Intel SE440BX-2PA PII/PIII ATX	$155

Y2K Concept Landmark Intel P-III .....

Y2K Concept computer with new fancy Landmark ATX case. As one of the Intel Authorized System Providers in Vancouver ATIC brings the famous Intel CPU P-III 500mhz based systems to cross the boundary of Y2K. The new fashion tower Landmark made your systems in a totally different style and fantastic speed than our competitors

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56k voice fax modem Supra
13.3GB WD ATA66 HD
ATI Xpert99 with 16MB and DVD drivers

Fujitsu KB and MS Intellimouse
Windows'98 full ver. W/ cd
MS Works, Works 4.5, Encarta'99
MS Suit'99 full kit
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P-III 450mhs
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Xeon-450 /2M L2 System

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1.44MB floppy drive
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i740 3D 8MB AGP video card
19" ATX tower case
40x CDROM
56k voice/fax modem USR Sportster
Fujitsu 104 Keyboard
Intel 100BT NIC
Microsoft Intellimouse w/pad

- **Intel Xeon 450mhz/512k.........$3500**
- **Intel Xeon 450mhz/1MB $5690**
- **Intel Xeon 450mhz /2M.........$7820**
- **Intel Xeon Dual 450/512k.........$5190**
- **Intel Xeon Dual 450/1M..........$9090**

Optional

with Dual 9.1G SCSI	+$590
with RAID UW scsi ctrl	+$450
with RAID W2W scsi ctrl	+$400
with ATX Redundant Power	+$450

NetBook TM 12" 13" TFT

Intel 266-400 MMX cpu 512k L2 cache
32MB RAM (w/ 64MB +$80, 96M +$150)
4.1G Toshiba HD (6G +$100)
56k Voice/fax modem Built-in
1.44 Floppy & 24x CD ROM Built in
Active True color TFT, Touch Pad, PS/2 port
2 PCMCIA slots (TWO Type II or One Type III)
USB, Infra, Parallel, serial, Ext SVGA
3D sound, Microphone & speakers built-in
NiMH Battery (with Li-Ion Battery +$90)
AC adapter (110-220v),
FREE carrying case
MSWin 98 full ver. w/ CD and license
All drivers preload and with cd

- **12.1" TFT 3DII-300mhz/ 3DII-333.....$1900/1990**
- **12.1" TFT 3DII 366mhz/ 3DII-400.....$2050/2150**
- **13.3" TFT 3DII 300mhz / 3DII 333.....$2150/2100**
- **13.3" TFT 3DII-366mhz/ 3DII-400.....$2230/2330**

with Car adapter	+$95
with 10BT combo card	+$80
with 10/100 BT card	+$150
with 56k & 10/100 Lan	+$350

NetBook TM PII 12" 13" 14" 15"

Intel PII 233/266/300 PII 512k L1 cache
32MB RAM (64MB +$80 128M $300)
4.1G Toshiba HD (6.0G +$100)
56k voice fax modem (no voice for 14"/15"),
1.44 Floppy 24x CD-ROM
TFT Active True color, 1024x768
3D sound, Microphone & speakers built-in
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2 PCMCIA slots,
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AC adapter (110-220 auto switch),
FREE carrying case & Win 98 full ver. with cd
All drivers preload and with cd

- **12.1" TFT PII 233mhz/ PII 266 ..... $2100/2300**
- **12.1" TFT PII 300mhz/512k $2650**
- **13.3" TFT PII 233mhz/ PII 266 .....$2350/2550**
- **13.3" TFT PII-300mhz/ 512K..............$2850**
- **14.1" TFT PII 266mhz/ PII 300 ..... $2750/3090**
- **15.1" TFT PII-266mhz/ PII 300 .....$3800/4100**

As one of the major providers of the notebooks in Vancouver we had sold over 2000 units of **Netbook** in western Canada. As the Factory authorized service center, we provide upgrade service for Toshiba, IBM, Compaq, Expert, Acer, Asus, Sharp, Canon, eWinbook, Netbook, Sceptre and other brands.

Notebooks

Toshiba

4020CDS · PII300/32M/3.6G/12.1" DSN/Win98	$2480
4020CDT · PII300/32M/6.0G/13.3" TFT/Win98	$2980
4030CDS · CII300/64M/4.0G/13.1" DSN/Win98	$2650
4030CDT · CII300/64M/4.0G/13.3" TFT/Win98	$2950
4060XCDT · PII333/64M/6.0G/14.1" TFT/Win98	$3780
4060XCDT · PII333/64M/8.0G/14.1" TFT/Win98	$4390
3010CT · P266MMX/32M/4.1G/10.4" TFT/Win98	$2790
7010CT · PII300/32M/4.1G 12.1" TFT/Win98	$4850

IBM ThinkPad

i1451 P200MMX/64M/4G/13.3"TFT/20x/56k/Win98	$3790
TP570Z PII 300/32M/4G/13.3"TFT/24x/Win98	$3500
TP560Z PII 300/64M/6G 12.1"TFT/Win98/56K	$4150
TP600Z PII 300/64M/6G/13.3 TFT/DVD/Win98/56K	$5450
TP390 PII 233/32M/3.2G/24x/12.1TFT/56k/WIN98	$2690

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Notebook Upgrade Centre

We can do the upgrading for the most of the models of:

Toshiba IBM Compaq Dell HP NEC
Fujitsu Acer Asus UMAX Sharp Canon
eWinbook Sceptre Twinhead Chicony Mitac
and other brands

PRINTERS

HP

HP DJ 340, 693C/722C	$185/220/360
HP 880C/ 895C / 1120C....	$300/350/615
HP 2000C 2000CN	$1100/1070
HP 1100 Xpress M /2100 M/2100M	$595/1030
HP4050 4050T/4050N/4050TN	$1600/1810/2090/2350
HP5000 5000N DN	$2090/2390/1690
HP8000/8000N/8000DN	$3110/3540/4190
HP8100/8100N/8100DN	$3060/4180/4690
HP ColorLaser 4500/4500N/4500DN	$1660/4130/5350
HP ColorLaser 8500/8500N/8500DN	$8690/9710/12690
HP OJ 635C color printer/copy/scan/fax	$690
HP laser 3100Xi printer/copy/scan/fax, lp.	$1090
Color Plotter/ HP accessories ...	www.ATIC.CA

Canon

BJC 150C BJC 4400C	$140/ $180

Lexmark

Lexmark 1700/3100	$330/101
Optra E3 (Special).	$530

Epson

Stylus 440/640/740	$100/255/350
Stylus 900 1440dpi/ 850 (PC/Mac)	$420/528
Photo Stylus 700 720x720	$530

Brother

HL 1020 1040DX/1050DX	$370/440/530
Toner TN 200, TN 250	$36

Okidata

OL 600 600Dpi laser	$370
Okipage 320/321 390/391	$450/610/480/650
[illegible]	[illegible]

CASE / KB /MOUSE / Cables

AT [illegible]	$29/55/65
ATX [illegible]	$55/60/95
InWin ATX case 17"/ 24" dipower......	$80/110
CI mini ATX 19 1 Server 2-in-1 Redundant	$80/550
Landmark 19" ATX 200 /ATX-299 plastic	$85/120
Mouse / Logitech 2B / Logitech 3B (PS2)	$8/12/18
MS IntelliMouse PS/2 USB.	$55/80
Logitech MouseMan 3B MouseMan+	$30/70
Logitech Marble mouse Ps2 /USB	$85/95
Logitech Internet KB / cordless mouse & KB...	$75/139
104KB Peptech721 / Fujitsu 4725	$12/19/60
MS Natural TouchPad KB.....	$40/65
MS natural USB / USB keyboard	$75/70
Scsi cable/ Wide scsi cable	$10/15
over 4 devices cable (scsi/UW scsi)	$35
Ext. Scsi cable / 25p-HD50p/25p-HD68p.	$25/40/40
ext. Scsi cable (any pin to Centronics).	$40
Rack mounting IDE/SCSI drawer.	$23/2
Rack mounting UW scsi	$10
Printer cables 10/15/25ft.	$5/10/18
Modem cables/Laplink cables.	$10/15
CorelDraw 8 /WinFaxPro v.8	$360/130
AntiVirus Norton/McAfee	$69/69
Partition Magic V5.1 Norton Utilities	$85/100
Simply Speaking Gold Simply Accounting	[illegible]

MULTIMEDIA

DVD KITS

Hitachi DVD1 Toshiba DVD3	$150/180
Creative DVD Encore x5 kit (retail)	$315
Toshiba DVD2 Black DVD3 drive	$120/250
Toshiba DVD3 kit (w decoder disk)	$330

SOUND CARD

16bit 3D sound card	$18/24
SoundBlaster 64 /AWE64	$11/11
SB PCI 128 / PCI 256 Value Live	$65/65/240
Diamond MX300 Turtle Beach	$119/5.69

CD-ROM

Creative 36x /Toshiba 32x Lite / 2PD 40x	$65/75/60
Acer 40x PPI 48x / Black Toshiba 52x	$65/80/100
Plextor/SONY/Toshiba/	$110/130/140
Backpack 4x parallel slimmed with sound.	$200

CD WRITER

HP 7200i ide Rewriter Retail 16x4x2x	$295
HP 8100 ide Rewriter 24x4x2x.	$380/385
Sony CRX100 kit / CRX200 kit	$395/495
Yamaha 4416s scsi 16x4x4ext kit /E	$430/470/430
Plextor 12x8x4x int/ext	$510/660
Plextor 20x8x4x int/ext	$620/730
rewritable cd-disk /Sony	$1.80/2.5
Recordable cd-disk/Sony	$16/30

SPEAKER

60W 80W	$12/$25
LNTS subwoofer kit / Explorer 8810	$60/78
Yamaha M?? w/Sub kit / MT10	$115/100
Altec ACS44/45 LWB/ADA305	$95/125 195/240
Creative MicroWorks /PCWorks 4point	$340/140
MicroPhone / Headset	$9/15

TITLES (w/CD-ROM kit or system ONLY)

Encarta'98 home bundle/ MS Suit'99 bundles.	$60/139
Corel WP Suit 8	$60
MS Office Pro 97 cd	$300
NT 4.0 Server 10 users workstation	$990/200

SCANNERS

HP4100C 5200C	$21?/360
HP6201C (USB) 6250C	$510/190
HP Doc-Feeder / Transparency for 6100C	$615/920
Umax 1220p 1220U USB	$175/270/315
Acer flat scanner parallel 620P / 620U	$100/200
Vigor Flat bed color	$110
Epson 636/ 636Pro	$730/1030
AGFA Snapscan 1212P 1212U	$170/290
Canon scan 620p 670p	$160/[illegible]

CAMERA / CAPTURE

Mega XD plus Capture	$1090
Mitsu DC 3? Plus	$1190
Kodak DC220 ZOOM / DC260 Digital	$790/1190
Zoltrix Capture card and Camera	$190
TV kit (TV Tuner)	$120
Logitec VI Mouse /pro	$100/150/190

ZIP / TAPES

HP 4C SC Travan	[illegible]
HP T5000 ext 2.5G-5G	$250/130
Seagate TR-4 4-8G int/ext	$290/340
Seagate DAT 4-8G 4mm int/ext	$960/1150
SONY DAT 5000 4mm 4G-8G drive	$990
HP DAT 4G 90mm / 4-8G 125mm	$890/1050
Y Power PCMCIA Reader kit for desktop	$90
ZIP 100M int ide /parallel	$100/165
ZIP 100M scsi int/ext / USB	$165/210/210
ZIP Plus scsi int / parallel	$240/24
Zip 250 Parallel/ USB	$275/275
JAZ 2G scsi int/ext	$450/520
Zip disk / Jaz disk 1G / Jaz 2G	$15/110/165
JAZ traveler SCSI to Parallel adapter	$60
ORB 2.2G int EIDE / SyJet 1.5 scsi int	$290/330
ORB 2.2G disk/ SyJet 1.5 disk	$65/ 95
Travan TR /TR3/TR4	$25/35 40
LaserSuper disk ext. / disk	[illegible]
DAT [illegible] DDS	[illegible]

NETWORKS / UPS

16 bit ISA combo [illegible] 32bit PCI combo	[illegible]
3I 81 PCI 10/100BT Ethernet.	$35
D-Link DE 530CT 10/100BT	$15
Intel PCI Pro 10/100 / Server Pro..	$90/ 11
3COM PCI 3C900 combo 10BT	$70
3COM PCI 3C905 100BT	$80
SMC 2000BT PCI / 8410 ISA/8432 PCI	$36/60/105
BNC/Terminator/T...	$3
Coaxial 10ft/20ft/50ft/100ft....	$6/9/19/35
Hub 9port 16port 10BT...	$25/150
Hub 100BT 8/12/16port...	$300/480/930
Hub OfficeConnect 3C16700 8P 10BT	[illegible]
Hub OfficeConnect 3C16702 16p 10BT	[illegible]
Hub OfficeConnect 3C16750 8P 10/100BT	[illegible]
Hub OfficeConnect 2p 100BT	$606
Hub 500 SP II 10/100BT 12p 3C16610	$880
Hub SP II 10/100 24p 3C16611	$1555
Hub 3COM 3C16440 Stack 10BT 12p	$270
Hub 3COM 3C16441 Stack 10BT 24p	$440
Hub 3COM 3C16405 Stack 10BT PS Hub 40 12p	$720
Hub 3COM 3C16406 Stack 10BT PS Hub 40 24p.	$1270
Hub 3COM 3C16450 Stack 10BT PS Hub 50 24p.	$1380
Hub D-Link 10BT DE805 5p / DE809 8p	$35/ 60
Hub D-Link 10BT DE812 12p / DE816 16p	$200/250
Hub D-Link 10BT DE824 24port	$340
Hub Intel InBusiness SH10T8 10BT 8p	$95
Hub Intel InBusiness SH10T8E 10BT 8p w/Cas	$125
Hub Intel InBusiness SH100T 100BT 8p	$280
Hub Intel InBusiness Pro 10/100BT 8p	$385
Router Intel Internet station 5010TPR	$540
Router Intel Internet Express 8100/9100/9200	$920
Switch Hub 3COM/Intel	list on WWW.ATIC.CA
NT 5.0 Server 5 110	$1190/1990
NT 5.0 Server25	$2390
NT 4.0 client access license/each	$45
NT Workstation 4.0 / Scsi	$210/560
MS BackOffice server V2.0/2.5	$2540/3 00
MS SMS v1.2 10/25 users	$1420/2200
MS SNA v1.0 w/5 users	$[illegible]400
UPS500/500/650.	$150/190/240
UPS Smart 450/700/1000	$390/550/690
UPS Smart 1400/2200/3000	$820/1200/1990
SurgeArrest Personal 7 w-tel.	$25.90
SurgeArrest Pro 7 w tel	$37.00
SurgeArrest Net 7 w tel	$40.45

Notebook Accessories

• Modems and Ethernet (PCMCIA)

56k PCMCIA fax modem [illegible]	$190
PCMCIA 10BT Ethernet combo	$90
Xircom 100BT	$210
Xircom 100BT + 56k fax modem realport	$490
3COM 10/100BT PCMCIA (3CXFE575BT) cardbus	$320
3COM 3?574 TX 10/100 LAN 16bit	$210
3COM 10BT (3CXE589DT)/10B Com (3CXE589DC)	$190/260
3COM 3CCM156B 56k global modem	$170
3COM 56K V.90 Fax modem w/ Cellu support (3CXM556)	$325
3COM 56K with 10/100BT LAN	$440
3COM 3Z900 128k ISDN PC card U int	$530
3COM3Z905 128k ISDN PC card S/T int	$475
Intel EtherExpress Pro 100BT PCMCIA 16bit.	$220
Intel EtherExpress Pro Plus 10/100 PCMCIA	$370
Intel EtherExpress Pro 100 with 56k v.90 modem	$490

• Batteries, Sound Cards, Backup, SCSI

Adaptec1450/1460/1480 SlimScsi	$140/230/290
ext. parallel CD-ROM 36x with power	$195
ext scsi 36x CD-ROM with case	$210
24x Bantam Ultra light CD-ROM parallel	$350
24x Bantam CD-ROM with sound parallel	$430
32x Backpack cd-rom parallel / with sound	$300/360
NewMedia sound / game port	$280/10
NewMedia SCSI Db25 / LAN 10BT	$125/110
Nogatech PCMCIA TV tuner	$305
Carrying case Targus Notepac CN01/20	$40/35
Universal caseCUNI / Leather case CLNI	$80/105
Platinum Leather case CPLC1/ Traveler CL80	$210/190
Kraken case CKN2/Convertible case CCB1	$80/70
Encore Air Leather case CELIA	$200
Battery NiMH / Li-Ion for Netbook	$90/180
Battery for Toshiba/IBM/Compaq/Sharp/Canon	[illegible]

Notebook Memory

• Toshiba	16M/32M/64M
T100,T105 T110,T115 T400 T405 T410,T415 T420 T425 T430 T435 T610 Tecra 500 series Tecra700 series and Satellite 300,	$80/140/call
Satellite 220 and Pro 440,460 470,490....	$85/130/240
Portege 300 320 330	$160/145/call
Portege 7000CT Satellite 4000 4010, 4020 and Tecra8000 series, 7010CT 2010CT.....	$70/130/200
Portege 650 660	$85/150/call
• IBM	16M/32M/64M
Thinkpad 760E,760ED 760EL, 760ELDScsi	$60/120/call
Thinkpad 365X,365XD 560 560Z 380, 380Z...	$60/120/200
Thinkpad 760C 760CD 760L, 760LD	$75/130/call
Thinkpad 750 755 486	$120/200/call
Thinkpad 345 360C/CE/CSE/P/PE, 370 755	$90/call/call
Thinkpad 770 600 770E, 770ED	$51/120/250
Thinkpad 550	$90/call/call
• Compaq	16M/32M/64M
Armada 7700Series, 7530 series, 15XX series ...	$80/120/200
Armada 1400, 7800	$55/110/200
Armada 4100 4110 4120 4150,4131 4220T	$70/120/220
Elite 5000 series	$75/120/220
• Others	16M/32M/64M
AcerNote Extensa 500 367 368	$60/100/200
Fujitsu Vision Book $10/150/230 Vistabook Pro...	$60/100/200

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ActionTec eases home networking

Continued from page 42

with an Internet service provider (ISP), then it is possible to install additional software to enable the sharing of the modem, phone line, and account. I decided to defer that until I tested the basic network connectivity

Up and running

The very first detail I checked was "phone jack sharing." I wanted to be sure that a computer could share a jack with a phone, at the same time. This approach to networking would lose a lot of appeal for me if two phone jacks were required in a given room one for the computer and one for the phone

In fact that is not the case The NIC connects to the jack directly and the phone connects to the NIC A modem, internal or external can be added to the mix. I made a phone call while copying some files between the two computers, and didn't have a problem with either task.

The second area I checked was speed The cards are rated at 1 Mbps exactly 10 percent of the 10 Mbps Ethernet standard, and one percent of the newer Fast Ethernet standard One Mbps or one million bits per second should correspond to rates of just over 100 kilobytes per second (100 Kbps) and that's the level of performance I experienced.

When I copied single large files I got rates of about 104Kbps When I copied folders with a large number of files in them the average rate slowed down somewhat It's the same with Ethernet or fast Ethernet. A single 10 MB file will transfer faster than 50 files totalling 10 MB

The obvious question is whether this is fast enough In the home setting, I think 100Kbps is fine for all but a small percentage of users Typical word processing and spreadsheet files will take a second or two to transfer Even files of several megabytes in size will transfer in under a minute Files of any size will transfer if you have the patience. I captured a TV program to disk using my ATI All-In Wonder card which generated a 251 MB AVI file I copied it to the other computer on my two-node ActionLink LAN just to prove that it could be done.

From the standpoint of Windows ActionLink works like an Ethernet LAN Participating computers show up in Network Neighborhood, directories and printers are shared in the usual way and so on

Share a modem too

In the mid to late 80s the number one reason for businesses to install a LAN was to share an expensive laser printer. In the late '90s, the number one reason for installing a LAN in the home is to share a phone line, modem and Internet account The ActionLink Kit makes that easy

The starting point is an ISP dial-up connection on one of your computers The DynaNAT software used by ActionTec performs some magic, but it won't make up for the lack of an Internet account. It installs nicely, and will even work with an AOL account, as long you are using AOL 4.0 software.

DynaNAT installs on each of your computers. On computers with an ISP dial-up networking icon it will offer to use that connection If you agree, the connection will be validated and your computer will be designated a Server Capable member on the LAN If you select No Connection your computer is designated as a Client Only member. There can be more than one Server Capable computer but at any given time all Internet access requests are routed through the same computer.

A computer running Windows NT must be designated as Server Capable This can cause problems if the computer doesn't have a modem I discovered this issue the hard way but it will be explained more clearly in the next version of the documentation

The installation of DynaNAT requires no technical expertise on the part of the user. All of the protocols are installed and configured automatically It is not necessary to get your hands dirty with TCP/IP intricacies.

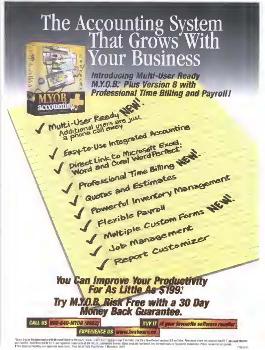
I went to the computer without the modem, and clicked on my Web browser. After about 30 seconds I had Internet access If the other computer had been online to the ISP the access would have been immediate Two users or more can access the internet at the same time and as long as no large file downloads are taking place, performance is what would be expected with the modem being used.

The initial release of ActionLink cannot use high-speed Internet connections like ADSL or cable modems, but that capability should arrive later this year. Other improvements can be expected in the future, like greater speed and interoperability with Ethernet LANs

Latest in a progression of LANs

As I mentioned previously, I've had an Ethernet LAN in the home for six years

Continued on page 55



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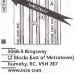

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Fujitsu	[illegible]	10ms	5400	[illegible]	UDMA33	$172
Fujitsu	4.3GB	9.5ms	5400	512K	UDMA33	$185
Fujitsu	[illegible]	10ms	5400	256K	UDMA33	$208
Fujitsu	8.4GB	9ms	5400	256K	UDMA33	$259
Western Digital	[illegible]	10ms	[illegible]	[illegible]	UltraDMA	$208
Western Digital	6.4GB	10ms	5400	256K	UDMA66	$229
Western Digital	8.4GB	[illegible]	5400	[illegible]	UDMA66	$249
Western Digital	13GB	9.5ms	5400	512K	UDMA66	$349
Western Digital	[illegible]	[illegible]	7200	[illegible]	UDMA66	$519
Quantum	6.4GB	9ms	5400	512K	EX UDMA33	$229
Quantum	6.4GB	9ms	5400	512K	CR UDMA66	$230
Quantum	8.4GB	9.5ms	5400	512K	CR UDMA66	$249
Quantum	[illegible]	[illegible]	5400	512K	EX UDMA33	$248
Quantum	12.7GB	9ms	5400	512K	EX UDMA33	$330
IBM	[illegible]	9ms	[illegible]	512K	UltraDMA	$340
IBM	16.8 GB	9ms	7200	512K	UltraDMA	$678
Maxtor	[illegible]	10ms	5400	[illegible]	UDMA33	$179
Maxtor	8.4GB	10ms	5400	256K	UDMA33	$225
Maxtor	6.4GB	9ms	5400	[illegible]	UDMA66	$218
Maxtor	16.4GB	9ms	7200	512K	UDMA66	$373
Maxtor	13.6GB	9ms	5400	256K	UDMA66	$319
Maxtor	17.2GB	9ms	5400	512K	UDMA66	$429

SCSI-2 ULTRA WIDE HD

Quantum	UW	4.55GB	9ms	7200	512k	VIKING II	$330
Quantum	UW	[illegible]	[illegible]	7200	[illegible]	VIKING II	[illegible]
Seagate	USCSI	9.1GB	9ms	7200	512K	BARRACUDA	$825
Seagate	UW	[illegible]	[illegible]	[illegible]	[illegible]	BARRACUDA	[illegible]
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Celeron(A) PPGA		$110	$135		$170	$236		
Pentium II MMX			$200	$260		$475	$750	
Pentium III MMX			$130	$160			$820	$1138
AMD K6-2 3D		$100		$119		$220		
AMD K6-3 3D						$460		

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Memory Type	4MB	8MB	16MB	32MB	64MB	128MB	256MB
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Regular 72pin Fast Page		$30	$60	$119	Call		
EDO 72pin	$18	$22	$38	$108	Call		
SDRAM 168pin			$30	$60	$135	$250	
PC100 SDRAM 168pin				$69	$130	$230	$435
ECC PC100 SDRAM				$80	$179	$318	

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ASUS P/II 233-500MHz PC100 P2B /P2B/DS /P2B-F	$180/606/291
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ASUS P5A SUPER7 ALI ATX W SOUND	$130/158
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LUCKYSTAR SUPER 7 512K 100MHz AT	$116
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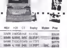

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ACER	[illegible]	PII-300	64MB	4.0GB	24X	13.3TFT	[illegible]	[illegible]
Compaq	1573DM	233MMX	32MB	3.2GB	20X	12.1STN		$2245
Compaq	[illegible]	PII-300	32MB	3.2GB	24X	13.3[illegible]	[illegible]	[illegible]
Compaq	3500	266MMX	32MB	4.1GB	20X	12.1TFT		$3839
Compaq	7000	PII-300	64MB	3.2GB	24X	13.3TFT	56K	[illegible]

Manufacture	Model	CPU	MEM	HDD	CD	Display	Modem	Price
Toshiba	4010CDS	PII266	32MB	3.82GB	24X	12.1DS		[illegible]
Toshiba	[illegible]	PII300	[illegible]	[illegible]	24X	[illegible]		[illegible]
Toshiba	8000	PII300	64MB	7.63GB	DVD	14.1TFT		[illegible]
Toshiba	[illegible]	[illegible]	32MB	4.1GB	24X	13.3TFT	[illegible]	[illegible]
Toshiba	7000DVD	PII266	64MB	8.1GB	DVD	12.1TFT	56K	[illegible]
Toshiba	4090XCD	[illegible]	64MB	5.96GB	24X	14.1TFT	56K	[illegible]

Manufacture	Model	CPU	MEM	HDD	CD	Display	Modem	Price
IBM	380Z	233MMX	32MB	4GB	24X	13.3T		[illegible]
IBM	[illegible]	[illegible]	32MB	[illegible]	24X	[illegible]		[illegible]
IBM	390	PII-266	32MB	4.3GB	24X	14.1TFT		[illegible]
IBM	[illegible]	[illegible]	32MB	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
IBM	560Z	PII-300	64MB	6.4GB		12.1TFT	56K	[illegible]
IBM	[illegible]	[illegible]	128MB	14.1GB	DVD	[illegible]		[illegible]
PROXCEL	88	166MMX	16MB	1GB	20X	11.3TFT	33.6	$1599
ASUS	P6300	PII-333	[illegible]	3.2GB	20X	[illegible]		[illegible]

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YAMAHA CDRW4416S KIT/ OEM /4416E OEM	[illegible]
MITSUMI 4X8 IDE CDR / 4X2X8 IDE CDRW	[illegible]
NO NAME CDR 74MIN 1/10PK	[illegible]
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Panasonic	[illegible]	[illegible]	0.27	1024 x 768	$240
Panasonic	17"	E70	0.27	1280 x 1024	$380
Panasonic	[illegible]	[illegible]	0.27	1280 x 1024	$450
Panasonic	19"	SL90	0.25	1600 x 1280	$848
Sceptre	[illegible]	D64	[illegible]	1280 x 1024	[illegible]
Sceptre	17"	D73A	0.25	1280 x 1024	[illegible]
Sceptre	19"	D07A	0.26	1600 x 1200	[illegible]
Viewsonic	15"	V655	0.28	1280 x 1024	$258
Viewsonic	15"	V55	0.27	1280 x 1024	$240
Viewsonic	17"	Q71	0.28	1280 x 1024	$368
Viewsonic	17"	V73	0.28	1280 x 1024	[illegible]
Viewsonic	17"	V75	0.26	1600 x 1200	$609
Viewsonic	17"	E771	0.27	1280 x 1024	$390
Viewsonic	17"	P775	0.25	1600 x 1200	$779
Viewsonic	19"	V95	0.25	1600 x 1200	$778
Viewsonic	19"	G790	0.26	1600 x 1200	$769
Viewsonic	19"	PS790	0.25	1600 x 1200	[illegible]
Impression	15"	50+	0.28	1280 x 1024	$199
Impression	17"	[illegible]	0.26	1280 x 1024	$338
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Cable leaps forward in digital services

Shaw Cablesystems enhances Internet services and launches digital cable service

By Jeff Evans

As mid-1999 approaches, high-speed DSL Internet services that use regular phone lines are finally being rolled out by many phone companies across Canada. These services offer from 15 to more than 50 times the download speed of a traditional telephone modem connection—the exact capacity varies from one phone system to another.

The cable companies, which had seized the high bandwidth high ground with their cable modem Internet services, are being challenged to show why consumers should continue to go with cable Internet services when a complete high-speed Internet package is now being offered as part of regular phone service. Shaw Cablesystems, with over 700 000 subscriber households across Canada, has risen to the challenge with a wide range of new or enhanced services, including digital cable TV (DCT), the ShawTV community information channel and upgraded Shaw@Home cable modem services.

Inside the glass house

At a special press briefing at the Shaw Cablesystems main offices in Richmond Hill, just north of Toronto, *TCP* was shown a large modern network data centre devoted to high-speed transmission of a wide spectrum of information services. The Richmond Hill facility is the heart of Shaw's Canadian operation, which currently includes about 100 000 Internet customers, and about 40 000 DCT customers, with thousands of new subscribers being added every month.

Using a huge concentration of high-speed servers, satellite links, and high bandwidth fibre optic lines, Shaw is determined to stay on the leading edge of the information wave. It even hopes to challenge the phone companies on their home turf of voice telephony with a competitive IP telephony service to be launched sometime in the future.

Cable Internet services share some features with telecom company services such as Sympatico, or general online services such as America Online (AOL), but they have their own peculiar and unique characteristics. For example, cable companies can only offer their services in the districts where they have been granted a cable licence—in effect, they are local cable TV monopolies.

As well, the cable modem services are totally "home based"—if you are a traveling professional who wishes to dial in for email from a hotel or office far from home, you would have to subscribe to a second online service to handle your "roaming" connectivity needs (Shaw representatives claim that they will institute a North America-wide roaming connectivity option later this year).

This then is the tradeoff offered by cable Internet providers, the richest mix of high bandwidth media, including up to 200 channels of analog television, digital video and music, Internet service, and local online community channels, delivered to both the home PC and home TV but limited to a fixed location.

Think globally, act locally

Shaw has invested more than $200 million in the last five years to upgrade and enhance its technical facilities, with the result, it claims, that it is the leading provider of a complete "wired home" service in Canada. Shaw representatives claim the company has done a better job of going "the last mile" to the individual home subscriber than any other high speed Internet service provider in Canada.

As part of its announcements in mid-March, Shaw invited the Mayor of the Town of Vaughan, Lorna Jackson, to preside over the launch of ShawTV, a 24-hour community online service in the greater Toronto region. ShawTV is leveraging the subscriber loyalty that has been cultivated through years of community programming produced by its local cable stations with an interactive, online version.

Shaw has allocated resources to allow subscribers to contact the ShawTV service via email or phone, and put local community announcements on the Shaw Web page. The result is a degree of true community interactivity, and an up-to-the-minute community information channel for Shaw subscribers.

Digital television and beyond

In the majority of Shaw subscriber areas, for $10.95 per month, or by purchasing a $299 digital cable terminal, home subscribers can add digital television (DTV) capability to their cable service. DTV offers higher video resolution and better digital audio quality than conventional television or radio, and also allows for premium pay-per view movies on demand, and other special interactive services.

As the first Canadian cable service to provide DTV, Shaw is offering a range and quality of services that neither the telephone companies nor the direct to home (DTH) satellite TV services can match. Shaw representatives told *TCP* that, in contradiction to the common public perception of cable TV companies as uncaring monopolies, Shaw realizes it is in a tough three-way race with the telcos and satellite operators. It is spending substantial amounts of money not just for shiny new gadgetry, but for better technical and customer support, and for community-based information services, in the belief that it will gain and keep its increasing number of subscribers by offering the most complete, pleasant and economical services to the wired homes of Canada. ❑

Shaw Cablesystems, http://www.shaw.ca

10 Mbps HomePNA in the works

Lucent, Epigram ready to 'turbocharge' phone line network standard

By Craig Menefee

ALLENTOWN, Penn. (NB)—Lucent Technologies Microelectronics Group and home network chip developer Epigram Inc. have become the latest alliance formed to push technology into the next-generation Home Phoneline Networking Alliance (HomePNA) standard. Version 2.0 of the standard aims to increase home network speeds by a full order of magnitude.

The current HomePNA specification covers data speeds up to 1 Mbps using what amounts to a stripped down version of the IEEE 802.11 Ethernet standard. Version 2.0 will turbocharge the data rate to 10 Mbps, a much more useful speed.

The higher speed is needed to handle broadband signals like CD-quality audio and video signals. Also, 10 Mbps is a standard Ethernet network speed. It will feel familiar to telecommuters, software developers, and others who work in the connected computing space.

To market watchers, the announcement may bring a sense of deja vu, because Lucent is not Epigram's first partner in the exploding home network market. Epigram made an alliance last November with 3Com to develop 10Mbps home phone line networks, a deal in which 3Com took an equity position in Epigram.

Then, earlier this month, 3Com and Microsoft allied to co-develop and co-brand home networking products. Microsoft also has an equity position with Tut Systems, one of the earliest home phone line network firms.

The various alliances involved in pushing HomePNA systems into the home may seem a tangled web of relationships, but Adam Stein, Epigram's director of corporate communications, says it all makes perfectly good sense to him.

"Lucent, through Bell Labs, almost invented the entire telephone system," Stein said. "They have a huge heritage in home phone systems. We already have a chipset that handles 10T speeds over in-place phone lines. It only made sense for us to get together with Lucent."

The Lucent deal involves broad cross-licensing of intellectual property for in-home networking and related communications technologies, the firms said. It promises to move Lucent's DSP (digital signal processing) modem and local area network (LAN) communications expertise into the home and within multiple devices.

Stein added, "If you blend the two [firms'] technologies, you get robustness and scalability. We'll build from that. We have 10 Mbps today, but we will demonstrate 100 Mbps over home phone lines and other impaired channels soon."

Stein won't talk further about Epigram's plans for non-phone line networks but both radio frequency wireless systems and power line systems that send data over existing electrical wires could be considered badly impaired in terms of data transmission.

"Home networking is what it's all about," says Stein. "That and simplified networking for small businesses. But the thing to remember is, we don't do any systems work, just the chipset. It's about ingredients. Think of Intel—it doesn't sell PCs. It sells chips to different system-level vendors."

He added, "We expect to take that a step further—Epigram is going to sell the lan

Continued on page 55

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The Legend continues The Legend continues The Legend continues The Legend continues The Legend continues The Legend continues

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10 Mbps HomePNA in the works

Continued from page 53

guage skills needed to connect PCs together."

Epigram has earned some credibility in the field. It demonstrated 10T phone line connections last fall at the Las Vegas Comdex computer show It also supplies the chipsets used by many system-level vendors. In addition to 3Com, its investors include Texas Instruments, the NetGear division of Nortel, and Panasonic

Also, Cisco Systems, working on a reference design that some analysts think will become a standard for bringing outside broadband connections into homes, used Epigram chipsets at the Consumer Electronics Show (CES) for a consumer network rollout, Stein says.

HomePNA has put a high priority on the 10 Mbps upgrade Cyrus Namazi who heads the HomePNA from his day job at AMD, said the rapid growth of the organization—membership companies rose to over 60 earlier this year—indicates the industry's high interest in the technology

"Actually, we're right on target with what we set out to do when we launched the alliance back in June, last year," said Namazi. "We said we were going to complete a spec back in 98 and we did it with 1 Mbps technology We said we were going to test the spec across the U S in real home environments and we did."

Lucent working with Epigram, hopes to submit its proposed version of the 10 Mbps HomePNA specification sometime next quarter. The two firms cross-licensed significant portions of their technologies as part of the deal according to Stein, partly in order to accelerate the development process

Lucent says the new agreement "blends Lucent's system-on-a-chip communications semiconductor, and home networking expertise with Epigram's expertise in VLSI [very large scale integration] architecture and high-speed data communications over new media."

Epigram's Jeff Thermond, president and chief executive officer, commented "We chose to collaborate with Lucent on this proposal because of Lucent's vast experience in communications systems and semiconductors. We recognize that a successful proposal requires the backing of more than one company"

The HomePNA called for specification submissions early in February and more alliances like Lucent and Epigram may be in the offing. HomePNA wants to publish the final 2 0 specification in the second half of this year. ❑

Epigram, http://www.Epigram.com
HomePNA, http://www.homepna.org
Lucent, http://www.lucent.com

ActionTec eases home networking

Continued from page 49

I started with a two-node LAN using two Intel EtherExpress cards and thin coax cable that were part of a Microsoft Windows for Workgroups Starter Kit I've added additional computers and an eight-port 10Base-T hub with a BNC connector over the years. I have computers on my LAN connecting with 10Base T or thin coax as appropriate I can add any of a number of industry standard devices to expand my LAN such as additional hubs and switches if I want to add computers or bandwidth. However adding computers to the network in distant rooms presents a cabling challenge

The ActionLink Kits for two PCs can be purchased for low as US$72 I would expect Canadian prices to be in the $120 range

Let's compare that with the cost of a two-node Ethernet LAN a four port Ethernet hub is about $75 Category 5 cabling is in the vicinity of $1 per foot brand name 10/100 Ethernet cards start at around $40 each and Internet access sharing software is an additional purchase since it is not part of the Windows OS (the next Windows 98 upgrade betas have included this feature, however) so let's say $60 The total is over $200.

It's clear that an Ethernet LAN, of the 10 or 100 Mbps variety, is faster than an ActionLink LAN It is also more expensive, particularly with long cable runs, and more difficult to setup particularly with Internet access sharing Then there's the question of unsightly cabling It will cost you hundreds of dollars if you hire a cabling professional to make it disappear.

The trade-off is clear. If you must have 10 or 100 Mbps performance, and you want to share your cable or DSL modem the traditional choice makes a lot of sense If you can accept the 1 Mbps bandwidth of an ActionLink LAN, and you want to share your 56Kbps connection to the Internet you gain an integrated, and easy-to-install solution for home networking that's priced to sell. ❑

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MAY 1999

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In brief

HP forms Internet business unit
PALO ALTO, Calif (NB)—Computer behemoth Hewlett-Packard Co is following through on its promise to begin aiming its business more directly at the Internet. In March, HP unveiled plans to create a new Internet-focused division that will market everything from software to electronic commerce (e-commerce) services over the Web.

In a number of appearances over the last month, Lewis E. Platt, HP's chairman, president, and chief executive officer, has detailed his firm's desire to become a high-profile provider of online tools and e-commerce services to businesses utilizing the Internet.

The new Internet Business Unit (IBU) will spearhead HP's "e-services" strategy, aimed at providing software infrastructure to business interested in using e-commerce. The IBU which will have headquarters in Cupertino, Calif was formed from Internet-related teams throughout HP's organization. The unit also includes HP's VeriFone subsidiary. It will consist of five divisions: E Services, Internet Security, VeriFone, E-Commerce, and E-Business Solutions.

Examples of the e-commerce initiatives being developed with IBU include programs that target online banking and creation of products for vertical industries as well as security and management applications.

HP http://www.hp.com

Shop for telecom products online
TOKYO (NB)—Telezoo is a new Web site that gives anyone in the market for professional telecommunications equipment the ability to compare prices and features. It includes equipment from Lucent, Newbridge, Cabletron, Shiva, Metricall, Cellular One, Pairgain and Ascend. To make it easier the site also standardizes definitions and adds a glossary to sometimes hard to understand networking terms.

Telezoo http://www.telezoo.com

Symantec ads FoneSync to ACT! 4.0
Symantec Corp. has announced an agreement under which Act! 4.0 will be bundled with Paragon's FoneSync and accessory software.

ACT! 4.0 is contact and calendar management software for small businesses salespeople and small sales teams. FoneSync is a PC based synchronization software that will allow ACT! 4.0 users to transfer up to 250 names and numbers from a desktop databases directly into a digital wireless phone.

According to Paragon, FoneSync transfers data from the desktop PC to the digital wireless phone with a single mouse click. It also has a two-way synchronization feature, so names and numbers added to the phone on the road can later be transferred back to the desktop database. FoneSync also automatically also amends and formats country and international dialing codes as the user travels. FoneSync is supported by most major digital handset manufacturers.

Symantec says the FoneSync/ACT! 4.0 bundle will be available for a limited time for an estimated retail price of $199. A separate US$40 serial cable required to connect a cell phone to a PC can be ordered by calling Paragon Software directly —*MJ*

Paragon Tel 888-777-6820
http://www.paragonsoftware.com
Symantec, http://www.symantec.ca

Continued on page **102**

E-commerce and you

E-commerce promises big things for buyers and sellers

By David Tanaka

So what you may ask, does all the buzz about e-commerce have to do with you? Quite a lot, actually, but it partly depends on whether you are asking the question as a consumer or as a businessperson with something to sell. (As a business-to-business process e-commerce is achieving high levels of integration with a corporation's other accounting and procurement systems, and we will not deal with that subject in this article.)

As a consumer, you may find that you increasingly treat portions of the Web as a combination shopping mall and mail-order catalogue. Last year Evans Research Corp., a Toronto technology market research firm, released results of its residential Internet user study. It found that 56 percent of respondents in its study said they had purchased goods or services on the Internet. Of those who did buy over the Internet, 39 percent said they made purchases monthly, and three percent said they bought goods weekly.

The items most frequently purchased online were computer software, computers and peripherals, and books. Other popular items were music, financial products, travel, tickets for events and clothing.

An Evans spokesperson said he hadn't analyzed the most current data, but you just have to look around to see the unmistakable signs of growth. From the recent stock frenzy surrounding the online auction site bid.com to the visibility of sites such as amazon.com, there's a lot of attention being paid to consumer purchasing over the Web.

Just bill me

One of the latest wrinkles to make online buying easier for you was announced by BCT Telus (the merged B.C. and Alberta telco) and eCharge Corp., which is based in Vancouver and Seattle Wash. The two companies have launched a service that allows Internet shoppers to bill their online purchases to their telephone account. According to the company, if you choose to buy a product or service on an eCharge supported site you are diverted by eCharge software to a 1 900 number where a transaction takes place. You are then reconnected to the Web site, and the charge for the product shows up on your next phone bill.

BCT Telus says the eCharge service was rolled out in Canada at the World Ski and Snowboard Festival held in Whistler/Blackcomb in B.C. on April 9-18. By going to http://www.wssf.com, customers could order ticket packages for the event.

eCharge spokesman Geoff Davenport told *TCP* that although there is no technical limit to the size of the transaction, there is a psychological zone of comfort. "No one wants to see $1,000 charges on their phone bill." He said for the snowboard festival a two-ticket package sold for as much as $120 and this was probably at the upper end of what people are willing to see appear on their phone bill. Although the service is being launched by BCT Telus, reciprocal billing arrangements among the regional telcos make eCharge available across Canada.

Another eCharge spokesman Erica Beyer says the B.C. chapter of The Canadian Cancer Society has also signed on to the eCharge service. Surfers can make donations to the society online and have the amount show up on their phone bill. She says in the U.S. groups like the American Red Cross and other health organizations are eyeing the service as a way to reduce the high cost of processing small donations such as $5 personal cheques. She says another type of service they see fitting well with eCharge is magazine subscriptions.

Presently the eCharge works with Internet services that use a telephone dial-up connection. The company states that support for cable modems, ADSL and ISDN connections is scheduled for later this year.

Service collectives

For retailers trying to set up a virtual store front or catalogue outlet, there seems to be an often-confusing array of services available. One trend is the rise of service collectives—groups of companies with diverse skills coming together under an umbrella company to offer an end-to-end e-commerce package to the retailer. The retailer has a single point of contact, reducing the need to become involved in all of the steps in the e-commerce chain, from designing a Web site and online catalogue to obtaining a merchant credit card account. A couple of Canadian service collectives that have come on the scene are the eMerge Alliance, and nGage ➤

E-commerce state of the union

Electronic commerce has outgrown a single definition. It is now so far-reaching in scope, capability and purpose that it is part of every sector of the commercial world—from manufacturing to banking to distribution to retail operations. It is the future—and it is arriving fast.

By Geof Wheelwright

Before diving too far into the ocean of new electronic commerce (e-commerce) developments it is worth taking a step back and looking at how we got here The truth is that each industry sector arrived at e-commerce from an entirely different direction and yet they have all converged at a single point in time right now.

Banks started on the road to e-commerce in the late 1970s with research into what was then known as the EFTS (electronic funds transfer system). The arrival of automated teller machines (ATMs) was the first step down this road—a road that eventually led to the creation of Interac in Canada and similar "debit card" services worldwide

By 1994, most banks were offering some form of telephone banking service, and eventually began offering "PC banking" via dedicated phones shortly thereafter. With the explosive growth of the Internet and the World Wide Web, however banks quickly came to realize they would have to do better than that to survive in a rapidly changing world This represented a big challenge as banks were not renowned for being particularly good at changing quickly

In just three years however we have seen all major Canadian banks make enthusiastic jumps to the Web They now offer bill payment transfer between accounts and even some limited form of investment in securities online

Retail outlets, led by upstart companies that didn't exist a few years ago have also made a fast transition, although not always a smooth one For many it has meant not only hanging out a shingle in cyberspace but also redesigning their entire business process to handle online business efficiently

Manufacturing companies, distribution firms and others that are typically one step removed from the retail business have also embraced e-commerce in the form of "business-to-business" electronic transactions that have become a natural outgrowth of the traditional electronic data interchange (EDI) applications of the past

Once you get customers online, how do you get them to come back?

Customer loyalty in the world of e-commerce is something of an oxymoron After all when you only have a virtual store to impress and entertain your customers, how do you keep them loyal?

You can't offer free coffee, doughnuts or have a sidewalk sale in the traditional sense And you're probably already working on pretty thin margins to stay competitive so it's going to be hard to keep customers loyal just by cutting prices

It's easy to say you'll use the Web to track your customers preferences and respond to them, but your customers may object to that—and your competition will be doing it anyway So how do you make a difference?

A lot of companies are beginning to look for answers to these questions as the "second wave" of e-commerce gets under way The first wave has been dominated by pioneers such as Amazon.com, CDnow e-Bay e*trade and others who respectively opened up the market for online retail sales of books, music CDs, auction items and securities

These companies won customer loyalty because customers didn't have a lot of other choices They also won the confidence of the general public by reliably and securely allowing consumers to use credit cards to make online purchases In other words they only had to do their jobs to keep customers

In this second wave however it is too late to merely be first in the market And even if you were first in the market you now have competition—and a lot of it

So a number of companies are now looking at the idea of "developing a relationship" with their online customers as a way to achieve loyalty during the second wave And they are turning to customer relationship management (CRM) software as one way of helping establish that relationship

"Using the Internet for interactive marketing selling and self-service is the buzz in the CRM industry today" says Tim Bajarin president of California based Creative Strategies Inc

He suggests that products such as the recently announced Pivotal eRelationship software from North Vancouver based Pivotal Software can help develop and track electronic customer relationships "It is a very promising application, because of the way it seamlessly integrates the Web with the existing CRM model, and especially because of the way it brings selling partners online to interactively collaborate in the CRM process," he adds

Pivotal says its eRelationship software is a "next generation" electronic CRM application suite that consists of two integrated Web applications Pivotal says this allows companies to build "Internet relationship hubs" for conducting online marketing sales and customer service with enterprise Web customers sales and service partners and prospects.

The first of these applications is known as Pivotal eRelationship PartnerHub which Pivotal boasts will provide a company's sales and service partners with personalized access to selling, marketing, and customer information that allows them to collaborate over the Internet

Meanwhile Pivotal claims that the second application—Pivotal eRelationship CustomerHub—will allow companies to extend Web sites with interactive capabilities for what it calls "one to-one marketing and customer self-service"

According to Pivotal Software president and chief executive Norm Francis, this kind of software can help business partners and their customers conduct "personalized business" online "[It is] where a myriad of front office activities are unified to result in one-to-one marketing, selling and customer service" he says. "Put simply the first companies that exploit the potential of Internet relationship hubs will have an unparalleled competitive advantage" ❑

E-commerce and you

Continued from page 54

Launched in February at Internet World Canada in Toronto, the eMerge Alliance members are Inex Corp Lasso Communications, Valu-Net Corp. and Citibank Canada Inex offers Web storefront creation and management tools, Lasso specializes in marketing and branding, Valu-Net has credit card payment software and Citibank offers the credit card transactions infrastructure.

Winnipeg based nGage Electronic Commerce's service was rolled out just over a year ago by MTS Advanced, a division of Manitoba Telecom Services Inc. Like the eMerge Alliance nGage is a service collective of companies specializing in transaction processing, accounting, and secure credit card processing as well as Web site design and hosting.

Last summer, nGage announced Commerce Express browser based catalogue building software that allows a business to create and manage an online catalogue with as many as 10 000 items.

nGage has also developed some interesting partner programs. For example the Certified Agent Program offers a way for Web site designers to offer a full e-commerce solution to their customers without having to become experts in financial transaction processing, secure credit card payments etc

In February Vancouver-based Multiactive Technologies and nGage announced an agreement under which Multiactive will build the nGage transaction system into its ecBuilder Pro ecBuilder Pro is Web site and catalogue creation software developed by Multiactive. ❑

nCharge http://www.ncharge.com
eMerge http://www.lasso.net/mtromt/emerge/
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TIM gets interactive

With five years of experience, Thomson Interactive Media (TIM) is no Johnny-come-lately in the electronic commerce universe TIM is part of Thomson Newspapers which is a division of Thomson Corp—a publishing conglomerate with annual revenues of about US$6 billion that has taken a sharp turn toward multimedia and electronic publishing in the last decade

While several of the company's clients are other large businesses—including major U.S newspapers—TIM's director of marketing, Ed Manning, says the company's "online profit solutions" can be beneficial to smaller enterprises.

Manning says TIM is "the first fully integrated Internet suite designed to help bring buyers and sellers together.' The suite of searchable classified ads, directories, and Web site builders supports streaming video, email 360-degree immersive photography, maps, and session tracking information Following are some of the suite's elements:

Classified IQ: Clients using this service send in ad text, which Classified IQ parses and makes searchable. TIM says the resulting ads support email, hotlinks, photos video and archiving, and can be searched using Classified IQ's multi-level search engine

Encore Site Builder: The only thing required to create sites with this product is a Web browser, according to TIM Through it, a client chooses a template uploads photos, music, graphics and sets background colors fonts and patterns Its developers say this can all be done in as few as 15 minutes and the resulting interactive sites are searchable on several levels in a matter of days TIM says it can also create customized branded templates for clients to give each site in an online directory or community a common look. Encore sites support maps links email, photos, video and 360-degree immersive photography They incorporate multiple levels of security and generate reports

Directory Express. This service creates online directories, catalogues and other listings, which can then be linked to automatically created Web sites For example a client can create a wedding directory using this service and site visitors could search for services they need, such as musicians After typing in their criteria, a list of performers matching it is generated. From the list, the directory visitor can then click on the name of a band link to its site and explore its photos audio and video clips They can also book the band through the Web site By assigning a password to the band (or to any business in such a directory), it can modify rebuild or enhance the site itself. Listing entries and site modification are done online in real time Because sites are built "automatically" maintaining a directory or listing service is simplified.

TIM's Web site includes a "tour" of these and other services in the suite, including those tailored to particular markets such as real estate —*Megan Johnston*

TIM http://www.thomsoninteractive.com

Online advertising evolves

By Geof Wheelwright

The World Wide Web did not start out being an easy place to make money. In fact, from its earliest days, the Internet was all about spending the money of U.S. taxpayers to establish a worldwide network of computers for the U.S. military establishment—and later its universities. It was not a place you would have thought most likely to host money-making ventures.

When the Web arrived in 1994, a lot of Internet veterans were aghast at the idea of commercial Web sites. There was tremendous online chatter about whether or not crass commercial interests should be allowed to intrude of what was thought of as a utopian wall of electronic free speech upon which anything could be written. Vocal opponents of commercial Web sites worried that the pure, unfettered—and often academic—nature of online discourse would be forever perverted by the entry of commerce.

So it started very subtly with "banner ads" used as a way of helping defray the cost of creating Web sites. The possibilities represented by the electronic ads at the top or bottom of Web pages, however, soon attracted commercial newspaper publishers.

Within two years, major newspapers such as *The Daily Telegraph*, *The New York Times* and *The Wall Street Journal* started their own online publishing ventures with the goal of seeing them largely funded by advertisers (although some have experimented with online paid subscriptions).

For advertisers, it was something of a leap of faith. It wasn't at all clear at the beginning how advertisers thought the Web should be used—and whether that bore any relationship to what would actually work commercially.

After several years of experimentation, many Web advertisers seem willing to bet heavily on Web-based marketing. However, it seems their future success will likely depend a great deal on the nature of the media in which the ads are appearing. And Web-based content is still evolving quickly, making it hard to decide how to advertise.

You only have to look at the evolution of other advertising-supported media to see how this might play out. When television news first appeared, it largely consisted of a newsreader being shown speaking the same script used in a radio broadcast. This made sense as radio was the dominant medium of the day—and the expectations of most early television viewers would have been measured against the benchmark of radio.

It was only as the medium matured that television news realized what it could do best, with live, highly graphical events such as the moon landing, conflicts and wars and decades of televised political debate changing the way we look at our world.

When you look at the Web, it is currently trying to emulate every existing media format—from newspapers to magazines to television to radio—and is succeeding to varying degrees in each. We are now beginning to see, however, a format that can exist solely on the Web: one that is very rich in content, includes text, pictures, video and audio as well as links to other places all over the Web.

The real power of advertising on the Web seems to be that you can go from an ad to the advertiser's "virtual" retail outlet with a single click of the mouse. You don't have to pick up a telephone, dial the toll free number and wait for someone to answer, nor do you have to put on a coat and head out in the rain. You just click and you're there. That seems to be the most powerful draw any Web site can offer an advertiser.

Web ads are very attractive for advertisers who can sell their products digitally. A lot of software companies, for example, can now sell and collect money for their products entirely over the Internet. They do not need to use courier companies to ship physical products as the entire product can be downloaded into a computer.

Continued on page 62

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CCL 400

Intel® Pentium® II Processor 400 MHz

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- Sound Blaster PCI 128 with 120W Speakers
- 32X (max.) CD-ROM drive
- Zoltrix V90 56k PCI modem
- Windows 98 (w/ CD)
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Includes Microsoft Works Suite 99

400 MHZ

$1498

$45 per month

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- Microsoft Mouse
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Includes Microsoft Office 97 SBE

366 MHZ

$1298

$39 per month

CCL C•433

Intel® Celeron™ Processor 433 MHz

- 64 MB SDRAM
- 6.4 GB hard drive
- i740 4MB AGP Video
- Integrated 3D Sound with 120 Watt speakers
- 32X (max.) CD-ROM
- Zoltrix V90 56K PCI modem
- Windows 98 (w/ CD)
- Microsoft Mouse
- 15" PB monitor

Includes Microsoft Office 97 SBE

433 MHZ

$1428

$43 per month

CCL 350

Intel® Pentium®II Processor 350 MHz

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- 6.4 GB hard drive
- ATI 8MB AGP Video
- Integrated 3D Sound with 120 Watt speakers
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- Windows 98 (w/ CD)
- Microsoft Mouse
- 17" monitor

Includes Microsoft Office 97 SBE

350 MHZ

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- [illegible]
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CCL 400

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- 8.4 GB hard drive
- ATI 8MB AGP Video
- Integrated 3D Sound with 120 Watt speakers
- Toshiba 40X (max.) CD-ROM drive
- Zoltrix V90 56k PCI modem
- Windows 98 (w/ CD)
- Microsoft Mouse
- 17" monitor

Includes Microsoft Office 97 SBE

400 MHZ

$1848

$55 per month

CCL3 450

Intel® Pentium®III Processor 450 MHz

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- 8.4 GB hard drive
- ATI 8MB AGP Video
- Crystal Sound with 120 Watt speakers
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- Windows 98 (w/ CD)
- Microsoft Mouse
- 17" monitor

Includes Microsoft Office 97 SBE

450 MHZ

$2098

$63 per month

CCL3 500

Intel® Pentium®III Processor 500 MHz

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Web grows as commercial medium

The Web is a gold mine of real time information. People are using it to quickly and easily research topics, including finance, travel and entertainment. With technological advances in security, the Web has also become a viable channel to buy and sell products and services. Internet companies such as Amazon, Yahoo, and Excite as well as telecommunication and cable companies recognize the huge opportunity that exists to capture a huge number of customers and their buying dollars.

Merger mania!

In November Netscape and AOL (both search engine portals) merged in a US$4.2 billion deal, bringing together Netscape's browser and electronic commerce (e-commerce) software business with AOL's 14 million customers. In January, Excite (a search engine portal with a reported 20,000 unique visitors per month) and @Home (a high-speed Internet provider with a reported 200,000 customers) struck a US$6.7 billion agreement. Most recently, Yahoo bought GeoCities for US$3.56 billion.

The mega merger trend will continue as companies strive to become the number one destination on the Web.

E-commerce growth trends

According to the latest forecasts from Forrester Research Inc. and International Data Corp. (IDC), e-commerce is expected to continue its rapid growth over the next few years. Forrester predicts that business-to-business e-commerce will grow from US$43 billion in 1998 to US$1.3 trillion in 2003—an increase of more than 3,000 percent. It also forecasts that business-to-consumer e-commerce will grow from US$4.8 billion in 1998 to US$17.4 billion in 2001—an increase of more than 360 percent.

Alternatively, IDC predicts business-to-consumer e-commerce will grow from US$10 billion in 1998 to US$39 billion in 2001—a 350 percent increase.—*Geof Wheelwright*

Despite limitations, peer networks remain popular

LAN LINE

ISSIE RABINOVITCH

I have two seemingly contradictory goals in this month's column. I want to offer some practical tips for peer-to-peer networking, and I want to indicate why such a network is seldom a good choice for a business environment.

In the peer-to-peer networking model, at least one computer acts as both client and server. Each of the other computers in the network can be a client—and thus access the resources shared on another computer—as well as a server. A peer network can be an appropriate solution for offices with a small number of computers, but even then a dedicated server leads to better results.

Why write about peer networks at all? The reason is simple, and practical. There are a lot of them around, and they won't go away. So I may as well try to offer some useful advice.

In a situation where computers are in short supply and dedicating one to the server function is not feasible, there's no alternative. This often happens in the home, where there are two or three computers but fewer printers and modem/phone line combinations for accessing the Internet. There are some attractive new products for home networking, as the main feature stories in this issue of *TCP* point out.

In a business setting, it is harder to accept the compromises of a peer network. In the past year, I've encountered only one scenario where a network without a dedicated server made sense. Accounting firms send out a team of professionals to conduct external audits. Very small businesses might be visited by a single individual, but usually several accountants arrive with their portable computers and set up shop for days or weeks.

A Toronto-area firm of chartered accountants I'm familiar with has found it useful to equip its audit teams with all the hardware required to set up a temporary peer network at the client's site. All of the notebook computers have Ethernet cards. A small hub, 10Base-T cables and a little configuration, and the local area network (LAN) is up and running within minutes. Each of the computers is a client. One of the computers shares its printer (also brought by the team), and one of the computers (possibly the same one) shares a data folder.

Lantastic used to be a popular software choice for peer networking, but most peer networks these days use some version of Windows. Every version of Windows since Windows for Workgroups in 1992 has had peer-networking capabilities, which may be a partial explanation for its popularity. A peer network can consist of any combination of computers running Windows for Workgroups, Windows 95/98, and Windows NT. However, to keep things simple, assume Windows 9x is being used in the following examples.

Microsoft's NetBEUI protocol is a good choice for a small network, peer or dedicated server. It's a fast protocol, with no configuration settings. TCP/IP, on the other hand, is highly configurable. In a small network, that's not a good thing. There are other possibilities, but none worth discussing for the purposes of this article.

As for security options, there's only one that can be implemented on a Windows 9x peer LAN: share-level security. This means each shared resources can be protected with a password. Unfortunately, the password is the same for all users, so only one user needs to disclose his or her password for the whole network to be breached.

Perhaps the biggest problem with a peer network is unpredictability, and there is no straightforward way to address it. If you want to access files in a shared directory on Computer A, it had better be turned on. If it isn't, you can turn it on yourself, but you'll need that computer's password. Without the password, you'll have to access the files in that directory while sitting at that computer. You can then take them back to your computer on a diskette, but I wouldn't call that networking.

Unpredictability raises its head again in other ways. A user may forget that his or her computer is performing server functions and shut it down. Data loss is one potential result of doing this, but frustration and loss of time are certainties. Something as trivial as the local user clicking on the Floppy A icon when there is no diskette in that drive can lead to problems.

When a computer that is sharing resources is down, the entire LAN can slow down because the other computers that are mapped to its shared resources will keep making automatic attempts to reconnect. A partial solution to this problem is to select the properties of Client for Microsoft Networks, and to choose Quick Logon instead of Logon and Restore Network Connections. This means Windows logs you on to the LAN, but your mapped drives are not reconnected until you use them. The alternative choice means that Windows makes repeated attempts to reconnect to drives that may not be active, which may lead to a very sluggish computer.

Backing up data is a vital task to any business situation. When the data is stored in several places rather than one, the task becomes more difficult. Depending on users to backup their local drives doesn't work. You may use a carrot, a stick, or both, but in the final analysis, you won't have a solid procedure in place. It's interesting that Microsoft's Knowledge Base contains the following advice:

"To make sure data on the network is backed up automatically, use a server-based network."

It is worth making an attempt to configure a computer for optimal performance based on what jobs it is performing on the LAN. On each computer that is used as a file or print server, go to the System icon in Control Panel, and choose Performance, File System. Select Network Server as the Typical Role of This Machine. This will help optimize the performance of the file system for supporting network server activities, but may lead to complaints by the computer's user about responsiveness.

A better approach would be to install Windows NT 4.0 Workstation on the computer that will host most of the shared resources. You will still have a peer network, but the performance will improve because Windows NT is a better server than Windows 9x. On a powerful computer, it's also a better client. ❑

Issie Rabinovitch can be emailed at drian@irtechnogroup.com

Online advertising evolves

*Continued from page **58***

In many cases, such companies also sell a "shrink wrapped" product through traditional retail channels, but the cost of delivering the all-digital product via the Web site is far lower. So it makes a great deal of sense for promoters of such products to make as many direct-delivery sales via the Web as they can. And getting "click through" traffic from popular online magazine sites is a good way of achieving that.

For companies selling a non-digital product, who use their Web sites for "catalogue-style" shopping, the attraction of online ads will increasingly be to get the attention—also termed "mind share"—of the demographically attractive online consumer. While online pioneers such as Amazon.com don't need to do much advertising to get their names in front of the cyberpublic, companies entering an increasingly established online marketplace will need every possible promotion tool to get their voices heard.

Statistics

Another strong appeal of online ads is the ability to easily measure their effectiveness. Demonstrating the value of print-based advertising is very tough. It involves analyzing some combination of statistics, including of audited circulation figures, and reader surveys. Not only is there a lot of work involved in gathering these numbers, but they are not available immediately.

On the other hand, it is easy to track how many people go to a Web site through a simple "visit counter." This gives advertisers a very real sense of how many people they reach in a particular week, day or hour. They can also track how many of those visits resulted in users "clicking through" to the advertiser's Web site.

Through the use of simple identifying technology such as "cookies" (which store a small digital ID on your hard disk when you visit a site and pass that ID back to the site when you revisit it), it is possible to track return visits and the identity of those visitors.

In short, Web advertisers can measure the effectiveness of their online advertising in a way that is simply not matched in any other medium. For successful Web sites, this should make advertising sales a lot easier. Web site publishers can show that their sites generated a specific amount of traffic to a customer's Web site.

This may, in turn, lead to an even more valuable proposition being required of Web publishers by advertisers. In addition to tracking how many customers click through to their site directly from an online publication, advertisers may also want to figure out how much they spend when they get there.

It's one thing to bring gawkers and browsers to your online store, but quite another to bring people who can and will spend money. ❑

Microsoft unveils Passport site

Microsoft wants to go shopping with you. The world's largest software company announced plans in March to offer a service it claims should eliminate many of the current inconveniences of shopping on the World Wide Web.

By Geof Wheelwright

SAN FRANCISCO—At the moment, every time you enter an online shop and decide to buy something, you have to provide a long laundry list of personal details to complete the purchase. For each of the purchases you make at each site you need to key in the details of how you will be paying for your purchase (i.e., your credit card information), as well as your address, telephone number, postal code and information on your preferred method of delivery

Microsoft has come up with a technology that it says will allow consumers to shop without having to repeatedly key in all that information It's essentially an "electronic wallet" in cyberspace

This is not a new idea for Microsoft, as cofounder and chief executive Bill Gates has promoted such a concept for much of the past decade. But this particular implementation of the electronic wallet idea could be quite useful.

Through a new service known as Microsoft Passport, you'll be able to have this electronic wallet—along with all your credit card information and delivery preferences—travel with you from site to site as you shop

You'll feel a little like the Queen, who reputedly never carries cash with her, allowing members of her staff to deal with such vulgar transactions on her behalf

Microsoft Passport is known as "single-click" shopping. After signing in at a "portal" site, such as the MSN (Microsoft Network) Web site, you can then shop at affiliated Web sites that support the technology

Passport holders who begin shopping at the MSN site will also have the help of a virtual "personal shopper" via a Web site known as Compare.net, which was purchased by Microsoft in March. At Compare.net, shoppers key in the product they want to buy and the site searches the Web for that item The result of the search is a list of where the item can be found and at what price.

The announcements of Microsoft's Passport and Compare.net services are only a small part of a much larger effort by Microsoft to become the key player in electronic commerce (e-commerce) The central element of this strategy is an e-commerce framework Microsoft is calling "BizTalk," which allows companies to conduct transactions with one another integrate applications and exchange transaction information

"The Internet has forever changed the way business is conducted," Gates said at the announcement. "With these tools, our hope is that the electronic commerce opportunity is opened up for everyone You don't have to be a big corporation with a well-known brand or a company with lots of available dollars to throw at e-commerce solutions With low-cost, high volume tools like these, we can accelerate the market and within a year get a million new businesses online."

And Microsoft is hoping this idea will have as much appeal in Canada as anywhere else. According to Ken Nickerson, general manager of MSN Canada, the company is looking to offer the Microsoft Passport service to Canadian customers at the same time as American consumers—probably in late summer or early fall.

Nickerson says reaction from Canadian retailers so far has been strongly positive. "It is fairly new and so far we have only been working with a few select folks, but there is this desire by all the Canadian retailers we talk to [to get involved]," he says "Certainly there is a recognition that e-commerce in Canada is catching on and we are catching up to the U.S." ❏

Study finds Net downloading equals nice earnings for storage firms

FRAMINGHAM, Mass. (NB)—The increase in Internet downloading is creating a groundswell of sales in the storage industry, according to a report just out from International Data Corp (IDC)

In its report entitled *Downloading and Storing Files from the Internet: An IDC End-User Survey*, the research company notes that 56 percent of commercial survey respondents and 45 percent of consumer survey respondents download data from the Internet at least a few times a week.

Wolfgang Schlichting IDC's research manager, says some respondents said they are downloading multiple times each day "Downloading data from the Internet provides a new opportunity for storage products," he said, adding that the firm found that hard drives are reaping the most benefit from this opportunity

Approximately 91 percent of commercial survey respondents and 81 percent of consumer survey respondents said they use hard drives for primary storage. The survey found that the size of the typical downloaded file is smaller than 2 MB

"Looking at only the typical file size, the opportunity doesn't appear to be very large. However, the high frequency and the long duration that files stay on the primary storage medium make this storage opportunity significant," he said

IDC found that the type of file that is downloaded varies by site type Email and application software are most commonly downloaded at commercial sites At consumer sites, however, graphics files still pictures or images, and clip art are most frequently downloaded

IDC also found that for secondary storage media the accumulation of data contributes the most to the storage opportunity However the opportunity also varies according to site type. Commercial respondents prefer Zip LAN and floppy as their media choice, while consumer respondents cited floppy and HDD as their secondary storage preference

"Even though vendors have increased HDD capacity and the installed base of PCs is young, end users will fill the capacity over time, and secondary storage media will play an increasingly important role," said Schlichting ❏

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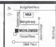

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- Gigabyte BX/C PII Motherboard
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- Creative Graphic TNT 16MB AGP

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- ASUS P2B F Motherboard
- S.B. value PCI Sound Card
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ATX 19"	$59
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AT Desktop	$30

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Panasonic 32X/Creative 36x IntTB IDE	$70/$87
Toshiba 36x/Pioneer 40x int SCSI/ID	$86/$110/$76

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Intel Celeron 300A w/Fan socket 370	[illegible]
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Quantum 12.7GB IDE/13 GB IDE	$316/[illegible]
W.D 3.2GB OEM	$171
W.D 4.3GB OEM	$180
W.D 6.4 GB OEM	$210
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Seagate	$Call
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Memory

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64MB SD DIMM (PC 100)	$110
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Acer 56K Int/Vo/ISA/V90	[illegible]
Acer 56K Int/Vo/PCI/V90	[illegible]
Diamond 56K Int/Vo/ISA/V90	$call
Diamond 56K Int/Vo/PCI/V90	[illegible]
Motorola/56k/V90/w GVC 56k V90	$43/$52

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Panasonic 17" S70/E70	$430/$[illegible]
Acer 15" 54E/56c (1 yr labour)	$call/$call
Acer 17" 75e (1 yr labour)	$call
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Daytek 17" 1738D	[illegible]
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Sony 17" 200ES	$call
NEC 17" A700	$call
NEC 17" E700	$call
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Proview 17"	[illegible]
Proview 19"	[illegible]
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Acara 17"/Acara 19"	$330/$[illegible]
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Asus P2B (PII PC 100)	$186
Asus P2B-S (PII PC 100)	$call
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Asus P2B-DS/MEL-M-443LX ATX(socket370)	$call
Asus P5A (AMD K6 II PC 100)	$137
Asus P5A-A (w Audio)	$153
GIGA 5AX/5AA (AMD K6 II PC 100)	$125/$call
GIGA 6BXC(PII PC 100)	$152
GIGA 5G100 (AMD K6 II PC 100)	$123
Luckystar/Houston/Acer	$check

Mouse

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Genius netmouse	$11
Designer mouse	$8
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Logitech 3B PS/2	$14
Logitech 1st Mouse w/ Wheel	$18
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Acer/UMAX/HP /Epson/Mustek	$check

Sound Card

Acer AW37 ISA	$16
SoundBlaster 16 ISA/64 ISA/PCI	$35/$63
SoundBlaster 128 PCI	$65
SB Live PCI retail	$call
SB Live VALUE PCI	$81
Diamond Sonic Impact PCI	$42
Diamond mx-300 PCI	$check

Video Card (PCI)

ATI 3D Expression /Rage8MB	$61/$[illegible]
S3 VIRGE 4MB	[illegible]
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Video Card (AGP)

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ATI Xpert@Play PC2TV 4MB AGP	$159
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Matrox Millenium G200 8MB	$160
Matrox Mystique G200 PC2TV 8MB	$[illegible]
Matrox Marvel G200 PC2TV 8MB	$375
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Diamond V330 4MB/VL 1000 6MB	$call
Diamond V550 16MB	$check
Voodoo III 2000/3000/3500 AGP	$check
Creative Labs 3D Blaster Banshee 16MB	$[illegible]
Creative Labs Riva TNT 16MB	$[illegible]

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Intel create and share USB	$call
Logitech quikcam usb/kodak dvc-323 USB	$call

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Diamond Monster 3D II 12MB PCI retail	$call
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Cambridge Sound	$check
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BNT 5000 A/7000 w/Subwoof	[illegible]
Logitech soundman extreme	$call
Yamaha	$check

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Houston720F(Dual PII socket)	$call
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http://www.viewsonic.com/
http://www.startek.bc.ca(vmsm)

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Lexmark CJP1100/3200/5700	$125/229/279
Umax Scanner 1220P/S/U	$129/215/225
Canon Scanner SB-320/FB-620P	$85/(s r)/219
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ESR could be notebook's killer feature

ON THE GO

GEOF WHEELWRIGHT

I don't do this very often, but I am warning you I am going to do it now I am going to saddle you with a new acronym—one I created myself purely for the purposes of explaining a key principle of mobile computing.

The acronym is ESR (effective speed of resumption) and it simply refers to the amount of time that passes from when you flip open the lid of your mobile computer to when you can actually start working on a given file.

I want my documents and I want them now! It doesn't seem like a lot to ask

In some ways, this issue reminds me of the days of black and white television I am old enough to remember a time before everyone had an 'instant on' color TV in their home If you wanted to watch a show on one of these old monochrome TVs, you had to "warm up the set" before you could actually see anything.

The same is true with the average notebook computer that runs Microsoft Windows 98. You switch it on and you wait—and wait and wait. It's about as much fun and is as productive, as watching paint dry

I am fed up with notebook computers that have an ESR of five minutes or more I want my documents and I want them now! It doesn't seem like a lot to ask in fact you can already enjoy instant access to your files if you use a notebook computer with a "stand-by" or 'resume' mode (although these never seem to work quite as reliably as you would expect)

There are two ways to achieve this mode The first is simply to put the computer's screen hard disk and other components into a 'sleep' mode and just trickle enough power through the computer to keep the memory intact so you can instantly resume working on documents. If you have a notebook computer with long battery life (such as the Compaq Armada which improves this even further by giving you a second battery in a carrying handle), this is not a bad alternative

The second option to achieve a "near-zero" ESR is a "suspend to-disk" mode This simply saves (on your hard disk) a snapshot of everything you were working on at the moment you suspended the notebook. When you restart the machine it reads the snapshot information and puts you back where you were before you suspended the computer

The advantage of this latter approach is that it allows the computer to be completely switched off and draws no battery power while in suspend mode On the other hand the computer takes longer to resume operation (thereby giving you a higher ESR)

An alternative to the two stand-by options is to use a handheld computer such as the Psion Series 5 a Palm Pilot or one of the many systems based on Microsoft's Windows CE operating system. All of these machines have an ESR of almost zero yet they are under powered compared to the typical Windows 98 based notebook computer

That is why I end up carrying at least two computers when I travel I always take the Psion Series 5 because it offers long battery life and allows me to get to work the instant I switch it on I also however typically carry a notebook computer to use as my "main system," which I keep in my hotel room for doing any heavy-duty computing work (such as downloading photos from my digital camera) The notebook computer stays plugged into the wall so it is instantly ready to use when I return from a meeting and want to transfer notes from my Psion or upload photos from the digital camera

Now if I were willing to merely plunk down a whole bunch of money for one of the more expensive notebook computers with long battery life and reliable suspend mode perhaps I could abandon this rather contorted approach to high-tech travel But I doubt it. I have been caught out too many times in situations where the single machine I have brought with me fails for some reason or another and I am left scrambling to find another way to send my data

So while it is nice to have a system with a low ESR it is not the only factor that goes into judging a mobile solution Reliability and robustness also have to play a role, particularly when you are hauling a computer all over the world Inevitably it or the bag it is packed in, will get dropped at some point or another. But that's another story ❑

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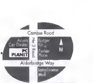

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Internet Explorer 5.0

Microsoft's latest browser focuses on functionality

By Graeme Bennett

After two public beta versions the official release of Internet Explorer 5.0 (IE5) is now available. We're testing it now and so far it seems quite stable and speedy (86 percent faster than Netscape Navigator 4.5 at accessing cached pages) but the large size of the required files makes it a challenging download for users with slow Internet connections. A minimum installation can take as little as 7.5 MB of disk space however the full feature-set requires over 100 MB. On one of our Windows 95 systems the installer told us it needed 9 1376 KB free on drive C to continue a "typical" installation. Obtaining the CD-ROM from Microsoft is a better plan for modem users.

Internet Explorer 5.0

From: Microsoft http://www.microsoft.com

Pros: Faster. Improved Search Assistant helps find email addresses. Web pages and other types of data. History list can now be sorted (automatically disregards the "www" prefix). Autocomplete feature types in Web addresses and fills in forms. Allows multiple connection configurations, making it easier for users with multiple Internet service providers to connect. Optional Web view of FTP pages.

Cons: Conflicts with some video drivers. No 128-bit version currently available. However the standard 40-bit version does include Server Gated Cryptography (SGC) technology, which allows international customers to conduct 128-bit transactions with banks and financial institutions around the world. Netscape Navigator 4.51 browser is slightly faster at loading pages with mixed text and graphics.

Synchronizing with IE5

When testing this browser, one of the first things we tried was opening another user's desktop (some 3,200 km away via TCP/IP) as an Active Desktop window, using IE5. In our test we opened the Desktop folder of a Macintosh computer on our PC and browsed text, Adobe Photoshop and JPEG files.

By right-clicking on a file (or even a folder) on the remote computer we were able to place an Active Desktop object onto our Windows Active Desktop containing the contents of the remote machine's window. Interestingly even though the files were not named in standard PC conventions (as Mac users seldom do), IE5 correctly recognized them. Double-clicking an Adobe Illustrator file yielded the Save or Open dialogue. By selecting Open, we were delighted to see that IE5 opened the Illustrator file with CorelDraw 8 (our system is set up to open Illustrator files with this software) embedded right inside the IE5 window! We could then view, save, print and edit the graphics files at will from "inside" the Web browser.

In another test we dropped a Mac SimpleText file onto our Windows desktop with formatting and fonts intact. Using IE5's Font controls, we could then increase or decrease the font size. And because the file was synchronized with the off-the-premises Mac, our Active copy would be automatically updated if the remote user edited the file! IE 5.0's new synchronizing feature allows you to update an offline site and download only the new elements. As well downloaded pages automatically download the required graphics in IE5. Very cool.

Big improvements to FTP

There are other dramatic changes as well. When accessing a remote FTP site for example, the files now look exactly like local files, with the same folders and window layout you would see if they were on your own PC. You can simply drag a folder on to your own desktop (or anywhere else) to download it.

Right-clicking a file yields a Download To option. The status bar shows what name you are logged onto the remote FTP site with. And, if you select Web Page View while connecting to an FTP site, you see further evidence of how much IE5 improves upon the lame-o FTP functionality of previous Internet Explorer releases. In this new version a checkbox for logging in anonymously appears, along with a place to type an email address and options to download files in text, binary or auto-detect modes.

We're still exploring the new release's dynamic HTML and XML features, but you can drop by Microsoft's Web site for an overview of these features.

The FTP functions of IE5 have been greatly improved over those of IE4 or earlier releases. For example, where IE4 would complain that "the server returned extended information" in cases where a password was required, IE5 provides a dialogue to enter the password. As well when the URL of, say, a password-protected directory was copied to an IE4 user's desktop as an Active Desktop item the operation would fail with a "not supported" error. IE5 can handle this and more. Its Web Page View mode even allows you to upload or download folders and files by simply dragging them.

Another new feature of IE5 is a dramatically revamped Media Player with enhanced video, audio and NetShow multimedia capabilities.

At the mid-March launch of IE5, Microsoft chief executive Bill Gates made a surprise announcement of Windows 98 SE, a second edition of the company's Windows 98 operating system due this fall that will include the new browser and a host of other bug fixes and feature updates, many of which were expected to show up this spring in a Service Pack release. Some observers questioned whether this was little more than a ploy to divert attention away from the company's slipping schedules for its next generation Windows 2000 release.

IE5 ships with one of its new features—IntelliSense—turned off, a move Microsoft admits is in response to users' security concerns. When enabled, IntelliSense automatically fill in passwords and other previously entered user data on Web forms.

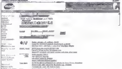
Another new feature, a radio bar, was not part of the recent beta release of IE5. With it, users can listen to music or newscasts from a variety of sources.

One feature from the beta did not make the final version of IE5: a "junk mail" filter. The filter was to be included in Outlook Express 5 but had to be removed after a California electronic greeting card company obtained an injunction against Microsoft, alleging that the feature barred users from being able to access its product.

IE5 can be downloaded for free from the Microsoft Web site. Microsoft strongly recommends uninstalling IE5 before upgrading from Windows 95 to Windows 98. They're not kidding. ☐

IE5 download tip

If you find Microsoft's primary download site bogged down and unable to complete the Internet Explorer 5 setup, try one of the alternate "mirror" sites listed at http://www.download.com. Note, however, that some alternate download sources "rebrand" the Web browser with their own start pages and, in some cases, customized icons. The browser we received from MSN Canada, for example, had an MSN icon in the upper right corner. TUCOWS has posted instructions for removing the customization features from its version, a user named Manji has set up a Web page devoted to "debranding" IE5.



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TCP Labs look at fixed and removable drives
Store this!

By Sean Carruthers

Out of space again? It's really not much of a mystery why this happens. As technology improves and manufacturers are able to make larger storage solutions, the hardware and software that uses the storage also becomes more demanding. Driver files get bigger, more utilities are required to keep everything running properly, and new software expands as features are added and improved.

Although games tend to be the greediest users of storage space, everyone seems to be getting into the act now. Windows 98 can take up to 355 MB of hard disk space for a full installation!

When you finally do run out of space on your computer, there are a few different ways to deal with the situation. The first is the most brutal: manual deletion of files. Every one of us probably has a ton of files sitting on the hard drive that have been abandoned for a long period. Cleaning up files this way can be satisfying in much the same way as cleaning an apartment with a mop and a bucket of soapy water: it feels good for a short period, but you know things are going to go back to the way they were again. It is a short-term solution, at best.

A hard decision?

A more long-term solution is to install a new hard drive. Computer systems that are a few years old have hard drives that seem laughably small when compared to drives currently on the market. After all, a 1 GB drive was pretty big news just a few years back, but what could you fit on it now?

If you're upgrading to Windows 98, the operating system will take a big chunk of that right off the bat. Then there are word processing programs, some other utilities, the swap file and by that point you've almost topped it up.

Never mind trying to play one of the newer games, as the minimum install on some of them runs into tens of megabytes and full install can easily take up .5 GB. If you have an older drive and an interest in some of the new games, a new hard drive would certainly be the way to go.

The variety of hard drives available now can be a bit mind boggling. Drives are available with a number of different interfaces and a number of different speed ratings. What should you look for?

Although some people prefer drives with a SCSI interface because of the increase in transfer speed, the IDE format is, by far, more popular. This is because of IDE's ease of use—there's no need to install a controller card, as the IDE interfaces are built into all motherboards. IDE drives also tend to be much cheaper than their SCSI counterparts of similar capacity. Lastly, although SCSI drives were previously available in much larger capacities than IDE, IDE has closed the gap so there's little difference between them in terms of size at the top end.

The most common speeds of drives at the moment are 5,400 rpm and 7,200 rpm. For general consumer use, 5,400 rpm is still most common, but some users are starting to crave the extra performance boost from the 7,200 rpm drives. If you are planning to run a lot of hard-disk intensive applications you may well benefit from a 7,200 rpm drive, but you should take care about the ventilation of your system. These faster drives generate quite a lot of heat, and if they're placed into a system with inadequate ventilation, the extra heat could shorten the life of the hard drive and other components inside the computer. Users opting for a 7,200 rpm drive may want to consider investing in an additional cooling fan, just to be on the safe side.

Of course, deciding on a size is also important

If there's one thing we've learned by now, it's that no matter how much free space we think we have on our computer, sooner or later it will run out.

While you can certainly get a smaller drive for a fairly good price, the difference between the smallest drives currently available and a larger one is not that huge. Going for a new drive that is "just enough" extra space may be a bad long term solution as you may find yourself in exactly the same position within a year.

At the lower-end, the difference between a 4 GB drive and a 6 GB drive may be only $20 to $30. A 10 GB drive may be less than twice the price of an entry level 3 GB drive. That extra investment may seem excessive at first, but it can certainly pay off down the road.

Can you handle it?

One thing to keep in mind when picking out a hard drive is whether your computer can handle a big drive snag free. Two problems can surface with the new larger hard drives: operating system and BIOS limitations.

Operating systems using an older file system (which would include DOS, Windows 3.x, early versions of Windows 95 and some installations of Windows NT) limit partition sizes to 2 GB. For a 10 GB drive this would mean dividing the drive into five smaller sections, which is a bit inconvenient. Newer operating systems like Windows 98, later versions of Windows 95 and NT (when using the NTFS file system) are able to use today's larger hard drives as one single partition.

Older BIOSes had caps on the maximum size of hard drive they would recognize, and even some recent BIOSes can't recognize drives larger than 8 GB. Many new hard drives ship with software that can help update the BIOS, but for some machines it may be necessary to upgrade the BIOS at the hardware level.

With all those factors taken into account, a new hard drive may be a great upgrade for your system, and one that will last for a few years.

Removing the problem

Another solution to the out-of-space problem is removable storage. By now everyone knows about the trusty old floppy disk, but many of us might want to look at higher capacity removable storage for a few reasons. Unlike a hard drive, removable solutions can be virtually boundless. With a 10 GB hard drive, you'll eventually run out of space if you keep adding files. With a removable solution though, all you need is more of the removable media (provided the file sizes aren't larger than the size of the media) to keep saving files.

Overall, a removable solution is more expensive than a new hard drive with the same capacity. Consider that a 10 GB hard drive may cost $300. An external Jaz 2 drive with 10 GB of storage space, on the other hand, could be over $1,500. With these numbers, why would you want to bother with a removable solution?

There are a couple of reasons, actually. Many users who are running out of space are doing so because of saved data files. Take the case of a user who doesn't see the need for installing a lot of additional software but could use space to save digital camera pictures, for example. This person may not really find it worthwhile to buy a huge hard drive and go though the hassle of installing and configuring a drive, especially when they have to transfer all of their old files over to the new drive.

Purchasing a removable drive and a few units of blank media may be enough to remove all of the files taking up space on the hard drive. Further down the road when more files start to clog up the drive, it's as simple as buying another removable disk. Repeat as necessary.

Another important benefit of removable storage is the ability to take large amounts of information with you and access it on another computer equipped with the same type of drive. If you've ever tried to move 10 MB of files from one place to the other using nothing but floppies, you know how frustrating it can be. With a higher-capacity solution, huge numbers of files can be moved in one shot.

Zip, Super and all that Jaz

One of the problems you will face when adding a removable storage solution to a system is deciding the form it will take. Many removable storage drives come in both internal and external versions, and those versions may require you to choose between IDE/SCSI or SCSI/parallel/USB. What's the best choice?

Each has its pros and cons. IDE devices require the user to open up the case and do some configuration with cables and jumpers, but at that point the computer generally recognizes the new drive and it can be used immediately.

SCSI, on the other hand, requires the user to either have a functional SCSI chain on the computer or be prepared to install a new card and do some troubleshooting. On the other hand, SCSI allows drive chaining beyond the limit IDE imposes, and the controller cards often support both internal and external drives simultaneously.

On the external side, SCSI has had the advantage for a while now in terms of chaining devices together, ease of use and speed, but that position is being challenged by USB (universal serial bus) devices. USB has a high transfer rate, and theoretically allows 127 devices to be attached. The ability to plug and unplug the devices while the computer is running is also an advantage. As USB is still relatively new, though, not all operating systems support it. Windows 98 is fully compatible with USB, provided it is on a computer that has the connectors on the motherboard, but Windows 3.x, NT and some versions of Windows 95 do not support USB devices.

For universal usability, many prefer the parallel port devices: pretty much all PCs have a parallel port on the back, whether they're desktops or notebooks. The device plugs into the parallel port, and then any printer would plug into the back of the new drive. While this sounds simple, there are a few potential problems. Parallel devices have a nasty habit of locking up systems for unknown reasons, often rendering printers unusable, and can sometimes require extensive troubleshooting to get the system functioning normally again.

While Windows 98 has made parallel devices a lot easier to install and use, earlier operating systems (most notably NT) can make parallel devices far more trouble than they're worth for some users. (See "Parallel Universe" in the April '99 issue of *TCP* for a detailed discussion of parallel port devices. It can be read online at http://www.tcp.ca.)

The tests

This month, we divided the Lab Report into

Continued on page 76

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- Logitech mouse & pad
- 1.44 Floppy Fujitsu
- 48x CD ROM drive Creative
- 64 Wavetable 3D stereo sound Diamond
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- 16MB Voodoo Banshee AGP - Creative
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Lexmark 5700 color printer	$305
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- Microsoft mouse
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- Microsoft mouse
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- ✓ 17" monitor
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- Diamond 3DFX Fusion 16MB AGP Video
- Zoltrix V.90 56k PCI modem
- Integrated 3D Sound
- Zoltrix 300W Subwoofer spkrs
- Windows 98 (w/CD)
- Microsoft mouse
- Zoltrix modem mouse
- 2 USB ports
- ✓ Microsoft Works Suite 99
- ✓ 17" monitor

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- 44X (max.) CD ROM
- Diamond 3DFX Fusion 16MB AGP 3D
- Zoltrix V.90 56k PCI modem
- Integrated 3D Sound
- Zoltrix 300W Subwoofer spkrs
- Microsoft 98 (w/CD)
- Microsoft mouse
- 2 USB ports
- ✓ Microsoft Works Suite 99
- ✓ 17" monitor

intel inside pentium III

- [illegible] 4x $1[illegible]
- [illegible] $87
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- Windows 98 (w/CD)
- Microsoft mouse
- 2 USB ports
- ✓ Microsoft Office 97 SBE
- ✓ Y2K ready
- ✓ 100 hours FREE Internet

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- 56k V.90 PCI modem
- Integrated 3D Sound
- Zoltrix 120W amp. spkrs
- Windows 98 (w/CD)
- Microsoft mouse
- 2 USB ports
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- 2 USB ports
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- ✓ 100 hours FREE modem

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- Iomega Zip Drive backup $97
- Upgrade to a 19" Monitor $349

$1749

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400MHz
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- Integrated 3D Sound
- Zoltrix 300W Subwoofer system
- Windows 98 (w/CD)
- Microsoft mouse
- 2 USB & 1R ports
- ✓ Microsoft Office 97 SBE

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Hard disks	Fujitsu MPD3108AT	Maxtor DiamondMax 4320 series 91303D6	Quantum Fireball CR 13.0	Samsung SV1200A	Seagate Medalist 13840	Western Digital Caviar 313000
Formatted capacity (GB)	10.8	13.03	12.7	12.5	13.6	13.02
Form factor (inches)	3.5	3.5	3.5	3.5	3.5	3.5
Interface type	UDMA	UDMA	UDMA	UDMA	UDMA	U-ATA/66
Buffer size (KB)	512	512	512	512	512	512
Spin rate (rpm)	5 400	5 400	5 400	5 400	5,400	5 400
Mean time between failure (hours)	500,000	500,000	NA	500,000	400,000	500 000
Drive benchmarks—Winbench 99 Disk Inspection Test						
Disk transfer rate—begin (Kbps)	6,670	6 180	8 640	7,850	5,340	8 010
Disk transfer rate—end (Kbps)	7230	8170	8670	7840	7080	8230
Disk access time (ms)	16.3	18	15.3	15.6	17.3	18.1
Disk CPU utilization (percent)	50.6	46.6	48.5	50.8	50.6	46.6
Contact	800-263-6716	800-262-9867	800-624 5545	905-542 3535	877 271 3285	949-932-5000
Web site	www.fujitsu.ca	www.maxtor.com	www.quantum.com	www.samsungcanada.com	www.seagate.com	www.westerndigital.com
Warranty	3 years	3 years	3 years	3 years	3 years	3 years
Price	$300 SRP	$325 SRP	$389 SRP	$316 SRP	$335 SRP (est from US$)	$300 street (est from US$)

Notes: Disk transfer rate: higher numbers are better Disk access time, lower numbers are better CPU utilization, lower numbers are better

Store this!

Continued from page 73

two parts. The first addresses fixed disks for those users looking for an upgrade of their existing disk to something larger. Though there are hard drives available in lower capacities we asked for drives between 10 and 13 GB, for a reasonable balance between size and overall cost.

Drives were tested on a 300 MHz Pentium II-based system with 128 MB of RAM and an 8 MB ATI Xpert 98 video card (set to a screen resolution of 800x600 with 16-bit color depth). Each drive was formatted with the FAT32 file system as one large partition and then had Windows 98 installed.

Benchmarking was done with Ziff Davis WinBench©99 disk test software. (*These tests were performed without independent verification by Ziff Davis, and Ziff Davis makes no representations or warranties as to their results. WinBench is a registered trademark of Ziff Davis Inc. in the U.S. and other countries. It can be downloaded for individual use at* http://www.zdnet.com.) The Disk Inspection section of the program tests transfer speeds over a period of time and gives transfer rates near the beginning and end of the test period. The test also checks the average time to access the disk, and a separate test determines how much of the system's CPU power is being used up in writing to the hard drive.

The second part of the tests was set up for the removable storage side. We asked vendors to supply us with removable storage solutions aimed at the consumer market. Testing was done on the above mentioned Pentium II system. We checked write speeds with a 72 MB single file and a 72 MB directory (composed of 476 smaller files). The file size was picked arbitrarily, just to get an idea of the differences in transfer times between drives, when file sizes get larger. The directory was constructed to match the single file in size, to illustrate the difference some drives exhibit when copying individual files (sometimes it's substantial).

Fixed hard disks

For this month's tests, we received only drives with a 5 400 rpm spindle speed. Users

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Netpro case
32x cdrom
1.44 floppydrive
Video card 2MB
Speakers
With PII celeron 300/333/366 $690/$700/$745

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Panasonic int 118
Iomega zip int 120

NETWORKING
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D Link 530 10/100bps PCI 39
D Link 528 10bps PCI 35
3COM 905TX 100&10bps 60
ACER 8 post Hab (10bps) 72
ACER 16 post Hab(10bps) 186
ACER 10M6S COMBOCARD ISA/PC1 21/23
ACER 6 Post 100bps hub 295
D LINK 5port 10bps 85
D Link 8part 10bps 98
3 COM 3C 16440 10port 238
3COM 3C 1441 12part 435
Network cables

Memory CPU
72pin EDO 4/8/16/32MB 13/20/40/50/94
128 SD RAM 16/32/64MB 36/61/116
128 Pc100 32/64/128MB 62/122/240
K6 II 300/335/350/ 102/117/143
K6 II 400/450 226/340
K6 III 400 480
Celron 300A/333/366/400 115/125/172/225
PII 333/350/400/450 232/256/424/725
P III 450/500 790/1080

HARD DRIVES
Fujitsu3.2/4 3/6 4/8 4/10 165/182/200/230/275
Quantum 3.2/4 3/5 1/6 4/8 4/10 3 160/182/222/240/255
WD 6 4/8.4/10 2/ 200/246/275
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Lexmark 1100/3200/5200 150/246/350
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Asus P5A-B Super 7 1024k 138
Asus P5A Super7 /w sound 138/148
AsusP2B 440BX Chipset 180
Asus P2L97 440 LX Chipset 182
Acer AX6BC Pentium II(BX Chipset) 148
Acer AX6LC Pentium II 115
ABIT BH6 BX Intel Chipset/LM6 159/120

MODEM
A OPEN 56K PC1 55
Motorola 56k V 90 PC1 45
USR KTX 56 PC1 63
US Rebotic Int V 90 w/vioce 117

VIDEO
ATI expert 98 8MB AGP 77
ATI expert at play pc2tv 138
S3 3D virge Dx 4MB 36
Cirrus Logic 3D 4MB AGP 38
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Matrox G200 Mellenium 180
Graphic Blaster Riva TNT 156
Voodoo2-8MB 120
ATI Expert 128 185
ATI Range Fury 250

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Samsung 40x CDROM 66

BTC CDROM 40/44X 66/71
Mitsumi CDR 8X2 320
HP CD Rewriter 7200/8100 380/490
DVD 3 ROM Creative encore kit 346
Pioneer DVD 3rd Generation 168
DVD 3 ROM Hitachi/Sony 182/195

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A OPEN AW/180 PC1 32
A OPEN AW/300 PC1 64 bit 38
Sound blaster 3D 35
YAMAHA 16 Sound vision 3D ISA 23
Sound Blaster AWE 64 ISA/PCI 58/66
Sound Blaster 128/Live value PCI 64/66

MONITORS
Acerview 15"(.28) 219

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can expect drives with a 7,200 rpm spindle speed to have higher performance and to generate more heat. The drives we've had a chance to look at, however, are still good performers, and the slower spindle speed means they're also easier on the pocketbook. Here's what we looked at.

Fujitsu Picobird 13 MPD3108AT
Suggested retail price: $300

Well-known for a wide range of technologies spanning from storage to notebooks, Fujitsu has introduced a number of new models in its Picobird 13 hard drive series, which now goes up to 17.3 GB. This one comes in at 10.8 GB.

As a mid-range selection in the Picobird 13 series, the performance is good, and there's a lot of space on the drive. Backed by the great Fujitsu name, most users should be pretty happy with one of these drives onboard.

Highlights

- 10.8 GB capacity offers plenty of space for applications and files.
- Transfer speed was reasonably fast on our test platform: 6,670Kbps at the beginning, and 7,230 Kbps at the end.
- Disk access time under Windows 98 was 18.3 ms.
- Drive uses Self-Monitoring Analysis and Reporting Technology (S.M.A.R.T) to detect problems before they destroy data.
- Warranty period for the drive is three years.

Maxtor DiamondMax 4320 series 91303D6
Suggested retail price: $329

The 4320 series is the seventh generation of the DiamondMax line, which includes disks of more than 17 GB. The 91303D6 is smaller at 13 GB, but still offers plenty of space and performance.

The 13 GB model in the DiamondMax 4320 line is a nice choice for a user looking to upgrade, as it has lots of space, is quite speedy, and comes in at a fairly reasonable price overall. While it doesn't have the best overall transfer rate of the drives tested this month, the price may make this one more attractive to a number of users.

Highlights

- At just over 13 GB, the drive has lots of space for applications and files.
- Data transfer was speedy: starting at 8,180Kbps and finishing at 8,170Kbps.
- Disk access time under Windows 98 was 10 ms.
- The drive uses S.M.A.R.T technology for maximum data protection.
- The warranty period for the drive is three years.

Quantum Fireball CR 13.0
Suggested retail price: $349

The CR series is a new addition to Quantum's Fireball line. At 12.7 GB, this model is the highest capacity drive in the CR line.

This drive offered speedy transfer times and quick seek times under Windows 98. With nearly 13 GB of capacity, it's a great choice for users who need a lot of storage space, too. If you are looking for extra speed while sticking with a 5,400 rpm drive, the extra cost may be well worth it.

Highlights

- The 12.7 GB offers a lot of space for applications and files.
- Transfer speed was consistently high: starting at 8,640Kbps and finishing up at 9,670Kbps.
- Disk access time under Windows 98 was 15.3 ms.
- The drive makes use of S.M.A.R.T technology to warn user of potential drive failure.
- The warranty period is three years.

(Thanks to Samtack Computer for providing us with a drive for evaluation. Samtack can be contacted at Tel 905-940-1880 or http://www.samtack.com)

Samsung Spinpoint SV1296A
Suggested retail price: $319

Samsung recently refreshed its entire hard drive line, with a new naming structure and new technology. This model is one of the newer high capacity drives in the Spinpoint V series.

This drive has a lot of capacity and good performance, all at a reasonable price. A lot

Continued on page 80

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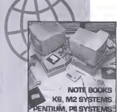

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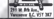

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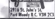

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ATI Fury 32 MB TV out DVD decode	$218
Optiquest Q71 17" Color Monitor	$345
HP 8110i EIDE CD Rewriter	$399
56K V90 Fax Modem	$29
IBM 14G 7200rpm Hard Drive	$499

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Canon BJC 4400	$185
Canon BJC 10/50 portable	$359/449
Canon BJC 5000 / 7000L	$359/469
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Canon MPL6000 laser printer/fax/scan	$749
HP	
HP DJ 340C/695C/722C	$305/260/395
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HP 2000C/2000CN	$1100/1670
HP1100xi Laser Printer/SP/SMP	$905/960/1190
HP4000/4000T	$1620/1830
HP4000N/4000TN	$2005/2355
HP8100/8100N/*1000N	$3060/4100/4690
HP ColorLaser 4500/4500N/4500DN	$3660/4330/5590
HP ColorLaser 8500/8500N/8500DN	$1690/9710/12890
HP OfficeJet 635C	$600
HP Laser 3100xi Printer/copy/scan/fax	$1090
Lexmark	
Lexmark 570/920N	$350/250
Optra S1855/S1855N 8M	$1670/2150
Optra LX+ PrintServer	$1699
Epson	
Stylus 440/640/740/850	$190/275/375/525
PhotoStylus 700/1520/3000	$309/249/1799
Brother	
HL 1020/1040DX/1050DX ($30rebate)	$370/430/520
HL1660E	$1199
MFC1970/MFC P2000DX ($30rebate)	$419/549
MFC4350/4650	$639/719
MFC7150/7650	$699/919
HL3050 7M (for Mac)	$560
Okidata OL 8W	$305
Label Printer	$299
QMS Color Laser Magic Color 20L	$1759

Store this!

Continued from page 77

of people are bound to find it a very attractive option.

Highlights

- 12 9 GB capacity means a lot of storage space for both applications and files
- Transfer speed was very good starting out at 7 850Kbps and finishing up at 7 840Kbps
- Disk access time under Windows 98 was 15 8 ms.
- The drive uses S.M.A.R.T technology to warn users of potential hard drive problems.
- Warranty period for the drive is three years

Seagate Medalist 13640

Suggested retail price $335 (converted from US$)

The Medalist line now goes up to 17 2 GB but we took a look at a 13 6 GB drive (which is a bit higher than our 13 GB target)

The Medalist 13640 was a bit slower during testing than the other drives this month, but many users may find the pricing and larger size of the drive very appealing It is definitely worth a look.

Highlights

- 13 6 GB is a good size offering lots of space for applications and files.
- Transfer speed started a bit slower at 5 340Kbps but worked its way up to a speedier 7 060Kbps
- Disk access time under Windows 98 was 17 3 ms.
- The drive has both S.M.A.R.T technology and Seagate's own SeaShield, for maximum protection of data.
- Warranty period for the drive is three years.

Western Digital Caviar 313000

Estimated street price $300 (converted from US$)

Another big name in the hard drive business, Western Digital has introduced a number of new members in the Caviar line. This particular drive is compatible with the new U ATA/66 standard which facilitates faster performance Time restrictions prevented us from testing the drive in a U ATA/66 environment, but the drive also performed well on an older system Users with a fully compliant U ATA/66 system should expect increased performance

Even on a system using the U ATA/33 standard, the Caviar 313000 performs quite well Although it's not the fastest drive under older systems, it's still quick, and users who have full U-ATA/66 support will find this drive's compatibility a great selling point.

Highlights

- At just over 13 GB there's a ton of space for files and applications.
- Data transfer was fast: starting at 8,010Kbps, also ending at 8 230Kbps.
- Disk access time under Windows 98 was 18.1 ms
- Users should expect increased performance when using a computer system that is fully U ATA/66 compliant
- The drive uses S.M.A.R.T technology for maximum data protection
- The warranty period for the drive is three years

Removable storage solutions

Unlike hard drives which are variations around a common design removable storage devices are all over the map in terms of medium and method of storage, capacity and speed Thus it is difficult to come up with a basis for comparison Although we do give an editor s choice in this category, you should keep in mind that any one of the devices reviewed below could be the ideal solution for you, depending on what your needs and budget are.

At *The Computer Paper* we've gone through a wide array of removable storage devices, from tape drives that were slow unreliable and held barely 40 MB, through magneto-optical drives of various capacities, to our current mix of CD writers and Zip drives

Fujitsu DynaMO 640 SE

Suggested retail price $850

Estimated cost of media $50

Magneto-optical technology is often thought of as a very high-end technology This drive from Fujitsu brings it down into a price range that is attractive to a wider variety of users

Fujitsu's DynaMO is an easy-to-use drive and it comes in an attractive curvy black

Continued on page 82

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HP 7200i IDE / 8100i IDE CD-RW	$399/499
Adaptec 1505 SCSI Card	$95
Windows 98 with New System	$138

Intel Power P-II

Intel Celeron 333MHz	$860
Intel Celeron 366MHz	$895
Intel Celeron 400MHz	$869
Intel PII 350MHz	$988
Intel PII 400MHz	$1,175
Intel PII 450MHz	$1,445
Intel PIII 450MHz	$1,495
Intel PIII 500MHz	$1,815

- Pentium II BX 100MHz Mainboard
- 32MB 168Pin SDRAM
- 4.3GB U DMA Hard Drive
- 1 44MB Floppy Drive
- 40X Int. CD-ROM Drive
- 16bit 3D Sound Card
- 100W Stereo Speakers
- SVGA 8MB AGP Video
- 15" SVGA Color Monitor
- 56K V.90 Voice/Fax Modem
- 104 Keys Windows Keyboard
- Standard 2B Mouse
- 17" ATX Tower Case with 250W

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- 4.3GB U DMA Hard Drive
- 1 44MB Floppy Drive
- 40X Int. CD-ROM Drive
- 16bit 3D Sound Card
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- 3D 4MB AGP Video
- 15" SVGA Color Monitor
- 56K V.90 Int. Voice/Fax Modem
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8 4GB Hard Drive +$55
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Intel Ultra P-II

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Intel Celeron 366MHz	$1,248
Intel Celeron 400MHz	$1 315
Intel PII 350MHz	$1,339
Intel PII 400MHz	$1 515
Intel PII 450MHz	$1,755
Intel PIII 450MHz	$1,949
Intel PIII 500MHz	$2,155

- MHT/Gigabyte PII BX 100MHzMainboard
- 64MB 168Pin SDRAM
- 6.4GB U-DMA Hard Drive
- 1 44MB Floppy Drive
- 40X Int. CD ROM Drive
- Creative SB AWE64PnP PCI Sound Card
- 100W Stereo Speakers
- ATI Xpert98 8MB AGP Video
- 17" .27mm SVGA Color Monitor
- 56K V.90 Int. Voice/Fax Modem
- 104 Keys Windows Keyboard
- Standard 2B Mouse
- 17" ATX Tower Case with 250W

UPGRADES
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Creative SB Live Value PCI +$40
Creative TNT Riva 16MB AGP +$70
3rd DVD Encore Drive +$125

Workstation Power

Intel Celeron 400MHz	$975
Intel PII 350MHz	$999
Intel PII 400MHz	$1,185
Intel PII 450MHz	$1,455

- Asus P2B PII BX 100MHz Mainboard
- 64MB 168Pin SDRAM
- 8.4GB U-DMA Hard Drive
- 1 44MB Floppy Drive
- 40X Int. CD-ROM Drive
- 3D 4MB AGP Video
- 10 BaseT Network Card
- Acer 104 Keys Windows Keyboard
- Standard 2B PS/2 Mouse
- 19" ATX Tower Case with 250W

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- 64MB SDRAM
- 4.0GB Ultra DMA/33 Hard Drive
- Built-in 1.44 floppy
- Built-in 24X CD-ROM Drive
- Stereo PCI Sound Card
- 56K V90 Modem
- High capacity Lithium-Ion Battery
- Weight 6 lbs
- Microsoft Windows 98
- Nylon carrying case
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- All-in-one Design
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- Intel BX chipset
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- 4MB SGRAM Video
- 96MB SDRAM
- 6.0GB Ultra DMA/33 Hard Drive
- Built-in 1.44 floppy
- Built-in 24X CD-ROM Drive
- Stereo PCI Sound Card
- 56K V90 Modem
- High capacity Lithium-Ion Battery
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- 64MB SDRAM
- 3.2GB Ultra DMA/33 Hard Drive
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- 96MB SGRAM
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- Stereo PCI Sound Card
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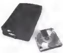
Continued from page 80

case, too. The speed of the drive, the lower price and the reliability that is the hallmark of magneto-optical technology make this a great pick.

Highlights

- It has an Ultra SCSI connection to the computer.
- Removable media size is 640 MB.
- Windows 98 and NT both recognize the drive



immediately after bootup when plugged into an existing SCSI chain.

Transfer rates

- Large file: 2:10 (both Win98 and NT)
- Large directory: 3:80 (Win98) 3:10 (NT)

Imation SuperDisk LS-120 2X

Suggested retail price: $170
Estimated cost of media: $25; $150 (10-pack)

The SuperDisk technology was developed jointly by a group of companies including Imation, Panasonic and Compaq. The technology is also called LS-120. LS stands for "laser servo," and the 120 refers to the number of megabytes of storage space on each removable disk. What makes LS 120 so attractive is that its disks are the same physical size as floppy disks and an LS 120 drive is backward compatible with floppies. We had a chance to look at the new double speed (2x) internal version of the drive.

It's easy to see why LS-120 has become a popular removable storage option. It replaces the floppy, and is bootable. It's easy to install and use. Plus, it's relatively inexpensive and has high-capacity disks. Overall, a great choice.

Highlights

- Internal IDE connector means the computer will recognize the drive instantly.
- Unlike the floppy drive, the drive will eat up one spot on the IDE chain, which could otherwise be used for a hard drive or optical drive.
- Windows 98 and NT should automatically slot the drive in at the proper drive letter without further configuration (the A: drive if the floppy drive is disabled, and B: if floppy still attached).
- When set up as the floppy drive, the user can boot using a 120 MB disk, allowing greater flexibility in such circumstances.
- Large file copy was speedy, but directories took longer.

Transfer rates

- Large file: 3:15 (Win98) 2:45 (NT)
- Large directory: 5:50 (Win98) 6:30 (NT)

Iomega Jaz 2GB external

Estimated street price: $599
Estimated cost of media: $179 (2 GB); $135 (1 GB)

Iomega has made quite a name for itself in the removable storage business, partly owing to the success of the 1 GB Jaz drive. Now, the Jaz drive returns in a 2 GB version.

Although the media may be a little too pricey for the Jaz 2GB to really catch on with home users, people involved in content creation will continue to find the Jaz to be a very useful tool. The larger size and backward compatibility make it a worthwhile investment for Jaz users looking to store slightly larger files.

Highlights

- Ultra SCSI connection means the computer should recognize the drive immediately upon bootup when attached to an existing SCSI chain.

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Removable storage

	Fujitsu DynaMO 640	Imation SuperDisk LS 120 2X	Iomega Jaz 2GB	Iomega Zip 100 USB	Iomega Zip 250 Parallel	Panasonic SuperDisk LS-120 2X	Panasonic LF-D101 DVD-RAM	Summatec MobileDrive
Connector type	Ultra SCSI external (internal avail.)	IDE internal (Parallel, USB avail.)	Ultra SCSI external (internal avail.)	USB	Parallel (SCSI avail.)	IDE internal	SCSI internal	EIDE internal (parallel external avail.)
Usable with	Win3x/95/98/NT Mac, Unix	Win3x/95/98/NT Mac (USB only)	Win3x/95/98/NT DOS, Mac	Win95/98, iMac	Win3x/95/98/NT DOS, OS/2	Win3x/95/98/NT	Win95/98, Mac(3rd-party driver)	Win3.1/95/98/NT Mac(EIDE), other IDE
72 MB single file write*								
Windows 98	2 min. 10 sec	3 min. 15 sec	2 min. 20 sec	2 min. 40 sec.	7 min. 5 sec	3 min. 15 sec	2 min. 45 sec	0 min. 20 sec
Windows NT	2 min., 10 sec	2 min. 45 sec	1 min 35 sec	N/A	8 min. 50 sec.	2 min. 45 sec	N/A	0 min. 45 sec
72 MB directory write*								
Windows 98	3 min. 30 sec.	5 min. 50 sec	2 min. 40 sec	2 min. 50 sec	7 min. 20 sec.	5 min. 50 sec	5 min. 20 sec	0 min., 32 sec
Windows NT	3 min. 10 sec.	6 min. 30 sec	2 min. 35 sec	N/A	7 min., 20 sec	6 min. 30 sec	N/A	1 min. 0 sec
Contact	800-263-8716	888-328-7758	800-697-8833	800-697-8833	800-697-8833	800-266-0616	800-266-0616	788 728-7807
Web site	www.fujitsu.ca	www.imation.com	www.iomega.com	www.iomega.com	www.iomega.com	www.panasonic.ca	www.panasonic.ca	www.summatec.com
Warranty	NA	1 year	1 year	1 year	1 year	NA	NA	2 years
Price	$650 SRP	$170 SRP	$560 ESP	$239 ESP	$319 ESP	$175 SRP	$1 149	US$149
Estimated cost of media (each)	$60	$25	$175	$20	$28	$25	$59	Varies with capacity

*averaged over three attempts

- The drive will accept the older 1 GB Jaz cartridges too
- 2 GB allows the user a lot of space to store files, which is especially convenient for those in multimedia production
- Transfer time is fast, and the optional Jaz Jet SCSI card speeds transfer times up even more.

Transfer rates

- Large file: 2:20 (Win98): 1:35 (NT)
- Large directory: 2:40 (Win98): 2:35 (NT)

Iomega Zip 100 USB

Estimated street price: $239

Estimated cost of media: $20 (or less)

While the Jaz has certainly contributed to Iomega's success, it's the Zip drive that has been the company's bread and butter. At 100 MB, the Zip has offered reasonably large removable storage, at a reasonable cost. Previous versions of the Zip have been internal, and external via SCSI and parallel connections. Now, the 100 MB Zip drive is being introduced in a USB flavor, with coloring to match the first generation of Apple's iMac

For users of the previous models of the Zip drive, this version isn't a radical departure, although it is a great offering for those who have recently bought an iMac and want an external storage solution. The speed is slightly better than the older SCSI model, and much faster than the parallel version so even Windows users may find a lot to like about this new incarnation

Highlights

- The drive attaches easily to both the iMac and to Win95/98 machines that have USB enabled.
- Installation of the drive is quick and easy and after initial installation of drivers the drive can be attached and removed from a system without the need to reboot.
- The 100 MB disks are identical to previous versions of the Zip 100 making it completely compatible
- At present, Windows NT doesn't support USB (it is expected in Windows 2000)

Transfer rates

- Large file: 2:40 (Win98)
- Large directory: 2:50 (Win98)

Iomega Zip 250 Parallel

Estimated street price: $319

Estimated cost of media: $30 (subject to change)

A bit more of a departure, this new version of the Zip takes the same form factor, but ups the removable disk capacity to 250 MB. Presently the Zip 250 is available in parallel and SCSI versions, we looked at the parallel version

For users of the Zip 100, this is the next worthwhile step up. While it will take a while for 250 MB disks to become widely used (meaning in the short term it won't be as easy to swap disks), the drive will also handle the 100 MB disks, too. This is a worthy successor to the Zip 100

Highlights

- Parallel connection means it can be attached to most computers without requiring extra cards.
- Larger disk size comes in handy for today's higher-capacity multimedia needs
- Parallel port versions may cause conflicts with other parallel devices, especially under Windows NT—users may need to troubleshoot.
- New 250 MB disks should not damage old 100 MB drives: 250 MB disks eject instantly when inserted into Zip 100 drives
- The parallel version of the drive reported slower transfer times. Where speed is a concern, users should opt for the SCSI version.

Transfer rates

- Large file: 7:05 (Win98): 8:50 (NT)
- Large directory: 7:20 (both Win98 and NT)

Panasonic SuperDisk LS-120 2x

Suggested retail price: $175

Estimated cost of media: $25, $150 (10-pack)

As one of the companies responsible for LS-120's creation, Panasonic does the actual manufacturing of the 120 MB drives. Thus, the Panasonic version is identical to the Imation drive reviewed above, including specs and transfer rates

Users looking for a high-capacity removable solution that can replace the floppy drive would also be well served by the LS-120 drive coming out under the Panasonic name

Panasonic LF-D101 DVD-RAM

Suggested retail price: $1 149

Estimated cost of media: $59 (5.2 GB), $39 (2.6 GB)

Since its introduction, CD-RW (rewritable) has become reasonably popular. It's only natural that a rewritable DVD solution would follow. While not yet capable of the full 17 GB that a DVD-ROM can contain, DVD-RAM is working its way up, with drives capable of writing 2.6 GB on each side of a blank DVD-RAM

The LF-D101 is certainly an impressive bit of technology, offering storage sizes comparable to some of the higher-end magneto-optical solutions, but at a fraction of the cost. The ability of the drive to read discs of so many other formats is a plus too. The major sticking point with the technology at this point is that there is the potential for a shakeup in the DVD-rewritable field, as not all the standards have been agreed upon yet. Although users are likely to be satisfied with the performance of this drive by itself, future incompatibility may be an issue

Highlights

- The drive connects via internal SCSI
- Media currently ships inside cartridges. 5.2 GB media is fixed inside the cartridges, but the 2.6 GB discs can be removed and used in other players that are compatible with the format.
- The loading mechanism will accept either cartridges or loose discs
- At present, the drive will read CD, CD-R, CD-RW, DVD-ROM, DVD video and PD discs
- At present, the 2.6 GB output is only compatible with a small number of other DVD players
- At the time of testing, NT drivers were not available, but were planned for imminent release. Mac drivers were available from a third-party source

Transfer rates

- Large file: 2:45 (Win98)
- Large directory: 5:20 (Win98)

Summatec MobileDrive and Station

Suggested retail price: US$149 (station)

Estimated cost of media: US$249 (2 GB), US$348 (4 GB), US$448 (6 GB), US$898 (8 GB)

Combined cost: Station is only US$100 when purchased with removable media.

The MobileDrive is a bit of a switch from the other removable solutions. In fact, the MobileDrive technology is actually standard hard drive technology and the station is essentially a hard drive dock that will accept specially configured hard drives.

Overall, this option may be a bit too expensive for most people. Still, some users may find this to be the perfect solution, the ability to boot from these large hard drives makes it possible to share a single computer between several users in an office environment, without compromising security. It's also a big plus to be able to use larger cartridges when they become available, without having to upgrade the station

Highlights

- The station connects internally to the IDE chain

Continued on page 85

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The portable theatre

Ultralight LCD projectors and multimedia notebooks put a new shine on presentations

By Jeff Evans

As a tech journalist I've been subjected to hundreds of traveling "dog and pony shows," demonstrations presented by computer technology firms showing some new product or service.

Typically the visitors arrive at our office carrying a laptop computer from which they run a PowerPoint slide presentation or on which they run the software for the product being demonstrated. Most often, everyone involved has to cluster close to the laptop screen straining to catch the fine details of the computer display The presenter has to somehow see what's going on without blocking the view of his or her audience At times, the process resembles a comedy routine with people craning their necks squinting, and bobbing their heads up and down trying hard to get a clear view and make sense of what's going on.

Anyone who has been in this situation has probably thought there must be a better way In fact there are several If the presenter carries a second, larger monitor along, or uses one at the presentee's office then the presenter can view the laptop screen comfortably while the audience looks at the monitor However, the size problem persists—unless a very large monitor screen is available, it's still hard for an audience of more than a couple of people to see what's going on. Wouldn't it be nice if one could carry a second, giant computer screen that weighed no more than a notebook PC?

The better mousetrap

As it happens, a nearly perfect solution to the mobile presentation challenge has evolved over the last few years. Multimedia notebooks have become lighter cheaper and designed to offer better graphics display capability, either on a large bright wide-angle active matrix screen or via RGB output to a large display device. At the same time LCD projectors have radically dropped in weight and increased in brightness and ability to display very high resolution graphics as well as full motion video As a result, both the long suffering presenter and his or her audiences can now enjoy audio-video presentations that rival a full-blown home theatre setup in quality, but from a system that weighs only about 9 kg (20 lb.) and can be taken anywhere

This was powerfully conveyed when Epson representatives came to show off some new products at the *TCP* offices a couple of months back. They brought one of the latest, lightweight LCD projectors, and a slim light weight multimedia notebook.

While the presenter viewed the PowerPoint presentation on his notebook, the audience, ranged around a large boardroom table, was able to comfortably view a 1.8 m (6 ft.) wide projection of the presentation at the end of the room. Everyone involved was able to concentrate on communication, rather than struggle with the medium being used

To test the viability of this method *TCP* asked for and received test units of light weight slim notebook PCs from NEC, Toshiba and Fujitsu and ultralight LCD projectors from NEC and Epson We tested the notebook/projector combinations over a two-month period taking them with us wherever we went and testing their effectiveness Here were the results:

Portability

The lightweight multimedia notebooks we tested were the new, metal lid slim models with removable drives or in the case of the Fujitsu a removable "slice" that contained a floppy drive or CD-ROM drive The stripped presentation weight of these notebooks including battery ranged from 2.25 to 2.7 kg (5-6 lb.) The LCD projectors weighed between 3.6 and 5 kg (8 and 11 lb.)

Including padded carrying bags or a little wheeled airline trolley for the NEC projector, the total weight of the digital traveling circus was between 8.1 and 10.8 kg (18 and 24 lb.) This is a significant load but using the trolley to reduce back strain, it was eminently portable.

Display quality

Both the LCD projectors provided very bright, crisp projected SVGA or better displays (resolutions of at least 1,024x768) The models we used were current top-of-the-line units with ferociously hot and bright light sources that threw images of up to 1.8 m (6 ft.) which were very viewable in moderate interior light conditions

These projectors handled regular PC graphics software programs such as Microsoft PowerPoint and Excel as well as Internet Explorer and Netscape Navigator Web browsers, video from a DVD drive on a Eurocom 8500 desktop replacement notebook, and regular video from a VHS video cassette player Audio from the included speakers on the LCD projectors was adequate for small meeting room purposes, though for a larger venue, as for a presentation where good quality audio is important it would be worthwhile to bring a set of external, powered stereo speakers.

Durability

We had no problems with breakdowns, light bulb failures or any other defects or weaknesses with the LCD projectors The latest LCD projectors seem to be quite robust, well developed products and have benefited from the several generations of LCD projector designs that preceded them We did have an occasional problem with a strip along the bottom of the image area being cut off by the NEC projector but easily fixed it by resizing the window on the PC Admittedly, we were careful in handling these units. They always traveled in padded containers and for reasons of avoiding either breakage or theft, we seldom let them out of our sight.

Bonus feature

An LCD projector is the equivalent of a truly giant monitor it can create a good quality projected image with a viewable diagonal dimension in excess of 2.25 m (90 in.)

This is truly "home theatre" size and quality but in a unit so light and portable that it can easily be moved around the office home or clients offices.

There is only one, non trivial barrier to *TCP* recommending an ultra-portable LCD projector to every computer user

Sticker shock

While a highly portable, multimedia presentation-capable notebook PC carries a slight premium in its pricetag, it is still only around $3,500 to $4,000 Lightweight high intensity LCD projectors, on the other hand, range in price from $8,500 to $13,000 with the really lightweight models clustered at the high end of the price scale. This cost is high enough to ensure only those with a real business case for ultra portable presentations will likely be able to justify the cost of a mobile theatre

However if you have a real need, and a budget to match for $12,000 to $17,000 one well-equipped presenter can take one heck of a show on the road without breaking his or her back. ❑

Store this!

Continued from page 83

but demands to be the master on the chain it is connected to. This could cause problems or force the user to substantially reconfigure their system

- Because the read/write heads are in the removable media instead of in the station it means there is no size cap on the media. As larger hard drives are introduced larger MobileDrive disks will be available.
- The MobileDrive can be set up as the boot disk, allowing the same computer to be booted up into different operating systems depending on which drive is inserted at startup
- Because they're self-contained hard drives, these cartridges are far more expensive than other removable solutions.
- The biggest advantage is speed, performance is similar to fixed drives inside the machine users can run applications from the MobileDrive without bottlenecking including games

Transfer rates

- Large file 0 20 (Win98) 0 45 (NT)
- Large directory 0 32 (Win98) 1 00 (NT)

Editor's choices

Hard drives
Quantum Fireball CR 13 0

Although all of the drives are worth consideration, the performance of the Fireball CR stood out Transfer speeds were high and access time and CPU utilization were both low For power users this one is an excellent choice

Removable storage
Fujitsu DynaMO 640 SE

In a strong pack of contestants the Fujitsu gets the nod for a few reasons Magneto-optical technology is often very expensive, and the Fujitsu drive brings it to users for a much nicer price In addition, the speed is good and magneto-optical media is held up as one of the most reliable around Users uncomfortable with SCSI may want to take a pass, but friends of SCSI will likely find this a very powerful addition to their systems ❑

Infospace launches Canada site

NB—Infospace which offers a selection of information finding resources has launched a new site for Canada The service will initially include a people and business finder reverse lookup email, neighborhood searches and other directory services. The service is particularly concentrating on the private label market, supplying its databases to other services under licence.

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Removable storage: make mine solid

By Sean Carruthers

We thought a couple of the other storage solutions that are currently being used a lot were worth mentioning in our discussion of storage SmartMedia and CompactFlash.

Both formats are solid state (no spinning disks or other moving parts), relatively small, and have become widely used in the digital camera and handheld PC fields. While not a mainstream storage alternative in the way a Zip disk is (especially since their write speeds are comparatively slow), the emergence of the digital camera market makes these formats worth watching.

SmartMedia

At 1 mm thick, SmartMedia is the smaller of the two formats. Because of this, the devices using it can also be slimmed down.

There are a number of ways to read SmartMedia An interesting option is something called Flash Path, a floppy-disk sized adapter into which SmartMedia cards are inserted. The adapter can then be slipped into a standard floppy disk drive (after installing the proper drivers) and the data read. Other options include PC Card adapters and docks that can be attached to a computer's parallel or USB port.

There are some potential problems with SmartMedia cards There is a series of metal connection points on one side of the card, and when inserted into a device, they are subject to abrasion Some users have reported that the lifespan of a SmartMedia card is a bit limited because of this

However more pressing is the size limitation Although the theoretical limit is much higher, the highest capacity card currently available is 32 MB

For the digital cameras currently on the market, even the 16 MB card (available for about $180) should offer a lot of space for photographs, even at the highest resolution. As resolution on the cameras gets better, this could be problematic, but for now, a camera user with a high-capacity SmartMedia card and a floppy adapter (roughly $139) is well set up for digital photography

CompactFlash

As far as capacity goes, CompactFlash technology seems to have the lead over SmartMedia Developed by SanDisk Corporation, CompactFlash cards are now available in sizes up to 96 MB. However this is at the expense of physical size At 3 mm thick, the cards aren't huge, but compared to the SmartMedia cards they can add a bit of bulk to a device that uses them

Connection to the device is made through a series of pins that are inserted into the media Although they're too big to be used in a floppy adapter, there are a few other ways to transfer data from the card to a computer. A $20 PC Card adapter for example accepts the CompactFlash card and plugs into the larger PC Card slot on a notebook computer. SanDisk also offers a docking station called the ImageMate available in both parallel (US$70) and USB (US$90) versions

We had a chance to test the USB version of the device and after a quick and easy installation the ImageMate showed up on the computer like any other removable drive and facilitated fast and easy transfer of data to and from the CompactFlash cards

Although the CompactFlash solution has been widely adopted by camera manufacturers the makers of handheld PCs have also jumped onboard Many Windows CE-based devices have a slot for extra CompactFlash memory This makes it easy to load up a handheld device with information from a notebook or desktop PC just copy the information onto the CompactFlash card then insert into the handheld. ❑

Thanks to Fujifilm for SmartMedia sample technology and pricing Thanks to SanDisk for a look at the USB ImageMate and a CompactFlash card

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Adobe Photoshop 5.0 forges ahead

Upgrade offers increased control, efficiency, revamped color management

By Peter Milburn

With the exception of Microsoft Office, no other software package has established a market dominance like Adobe Photoshop It is estimated that well over 80 percent of graphics professionals use Photoshop as one of their primary production tools

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Photoshop 5.0
From Adobe Systems Inc
http://www.adobe.com
Function professional image processing software
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Pros: new color management architecture with better Colorsync and ICC support history palette dynamic layer and text effects spot color support, expanded support for enhancing 48 and 64-bit images magnetic pen and lasso, multiple color samplers
Cons: image file history is only retained during one work session

Photoshop's dominance is not by accident Since the late 1980s Adobe has pursued an aggressive upgrade schedule that has matured the product into a potent image manipulator Not content to sit still and let its competitors catch up Adobe has yet another major release dubbed Version 5

> A bevy of common operations such as drop shadows, beveling, glows and embossing are reduced from multiple-step operations that require expertise and skill to simple one-step commands

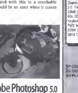
Major feature enhancements

The jump from Version 4 to 5 represents perhaps the most significant advancement of any Photoshop upgrade One of the most requested features from Photoshop users has been the ability to perform multiple "undos" and "redos " The new History Palette delivers this functionality but goes a step further by labeling each step you perform and displaying it as a sequence To move backwards and forward through your work history you simply click on its label and the image instantly appears in the state it was at that point in your workflow You can finally kiss goodbye those times when you feared making changes in an image without making a progressive series of revision backups

In shops where heavy Photoshop production takes place this feature alone is probably worth the upgrade price But, to avoid surprises, there are a few limitations of this feature you should be aware of

First, history operations are only recorded between the time you open and close an image during a session Second there will be a limitation to the number of history operations that can be recorded This is dependent on how much RAM you have and the size of the image you are working with Photoshop tracks these resources automatically and will start dropping the oldest actions while adding new ones as is required If you must preserve an image in a specific state to ensure that it won t be deleted in the queue, you can use the SnapShot feature.

A feature I'd like to see implemented is a permanent history of operations tagged to each image file Date and time information associated with this in a searchable database would be an asset when it comes to tracking your production



In an effort to shorten your production cycle, Adobe has added an Effects command to the Layer menu of Photoshop A bevy of common operations such as drop shadows, beveling, glows and embossing are reduced from multiple-step operations that require expertise and skill to simple one-step commands Now novices can create impressive effects

Another welcome feature is the ability to edit type down to character level formatting When you use the type tool, Photoshop automatically creates a type layer after you insert text into a dialogue box. The box contains familiar formatting controls such as leading, tracking baseline and alignment As long as you don t flatten your image, you can come back and edit your text at any time by double-clicking on the appropriate text layer in the layer palette Even special layer effects such as drop shadows, bevels lighting and transformation are preserved if you decide to edit them later on in your project

Smarter selection tools have also made a debut in Version 5 New are the magnetic lasso and pen that automatically detect high-contrast edges in a selection process Now you don't have to manually follow edges with painstaking detail Oddly, there is some inconsistent behavior between the different lasso tools The conventional lasso still annoyingly snaps back to its origin when you take your finger off the mouse button The polygon and magnetic lasso tools, appropriately, do not exhibit this behavior It s too bad that magnetic capability wasn't added to the rectangular marquee tool as well as there are occasions where this could come in handy

One of the most requested features that has become a reality is the support of spot-color channels Now it's possible to add Pantone (or any other specialty colors) metallic inks and varnishes to your pre-press jobs Keep in mind that the default in Photoshop is for spot colors to overprint when separations are produced

Customers who work with high-end scanners that support the capture of 48-

Continued on page 90

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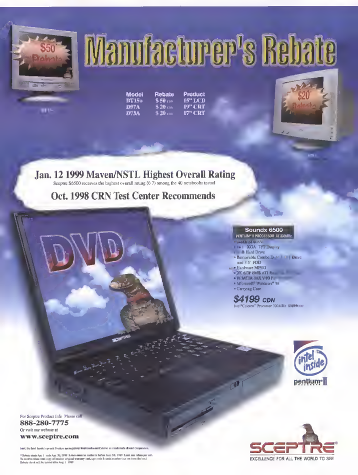

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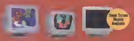

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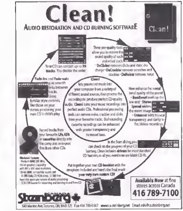

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Adobe Photoshop 5.0 forges ahead

Continued from page 87

and 64-bit color will really appreciate Photoshop 5's expanded support for manipulating these images. In addition to the Levels and Curves correction tools you can now also use the Color Balancing, Hue/Saturation, Channel Mixer, Image Size and Rotate Canvas dialogues. Many more commands are also accessible. However, you will have to convert your images to 8-bits per channel if you want to perform any filter operations.

Other advanced control features include a new color channel mixer that gives you greater control over color correcting less-than ideal images. A revamped Curves dialogue box now allows numeric value entries with the ability to automatically place control points on the curve by sampling color in an image with an eyedropper tool. This gives you much greater control over adjusting specific color ranges in an image. Color samplers now allow you to analyze RGB values in up to four locations in an image for simultaneous analysis. Another time-saving feature is the ability to have a live preview of duotone and indexed color images.

When Actions—a native Photoshop scripting language—was introduced in Version 4, it was limited because it only supported a portion of the command set. Almost all of Photoshop's commands are supported in Version 5.

Besides Actions, Adobe has now introduced a new type of plug-in architecture that enables the automation of complex and repetitive tasks. Automation plug ins are subtly different from Actions in that they can perform operations that are outside of Photoshop's command set. A contact sheet generator is one of a few plug ins bundled with the upgrade as a technology demonstration and tool for customers and developers.

In addition to the new features I've discussed there are at least a dozen other enhancements.

New color management paradigm

Photoshop 5 users will have to spend some time wrapping their heads around the complete revamping of the program's color architecture. Although it may be a painful transition for some, the benefits of much tighter control over color consistency will likely far outweigh any short-term discomfort from having to alter your way of thinking.

In previous versions of Photoshop, its built-in color engine transformed captured RGB values (from a scanner or digital camera, for example) and mapped them to your monitor's RGB color space. This device-dependent model meant you were confining your editing to the colors your monitor was capable of displaying. This baseline worked fine as long as you could calibrate your own monitor and limit your workflow to your own computer and output devices.

However, this method failed miserably if you planned (like most of us) to share your manipulated images with co-workers and other production facilities. Why? As anyone who has seen a wall of TVs in an electronics store knows, the color characteristics of monitors from various manufacturers (and even identical models from the same manufacturer) rarely share the same color space.

In Version 5, Adobe has cleverly circumvented this problem by giving users a choice of working in any of nine different idealized color spaces that are perceptually optimized for various types of production work. To describe all of these device-independent color spaces is beyond the scope of this review. However, some of their names will give you a clue as to what type of production they are optimized for. For example, sRGB is well suited for Web production, Colormatch RGB is ideal for prepress work, and NTSC is targeted for North American television video production.

By using this new method, you actually do all of your RGB editing in a color space that is independent of your monitor's color gamut. When you save an image file, it is tagged with your chosen space. When you open legacy images, or images from a different device-independent color space, you get a "profile mismatch" warning dialogue asking if you'd like Photoshop to perform a color conversion. This may give you a fearful pause, but bite the bullet and do it anyway. Adobe assures us that this transformation is almost lossless.

When Photoshop 5 images are viewed on any monitor, the idealized RGB color values are mapped to the monitor's RGB color space. This is done as accurately as possible by using your monitor's ICC (International Color Consortium) color profile. However, you must make sure you have enabled the Display Monitor Compensation check box in the RGB Setup dialogue box to get proper results.

ColorSync, Apple's system level color management software, is robustly supported in Photoshop 5 and extensively supports industry standard ICC profiles. Those who don't have the benefit of system-level color calibration can attempt to get reasonable color matching by generating a homemade ICC profile for their monitor using Adobe's gamma control panel.

If you need to get quickly up to speed on what the new color architecture means to you and your workflow, you should refer to the Photoshop manual and Adobe's Web site. There are also some excellent third-party Web sites and reference books on this topic.

The bottom line

Photoshop has earned its leadership position by introducing many technical and user interface advancements over the years. Version 5 continues its tradition as the premier image manipulation tool for photographers and graphic artists.

Photoshop 5 is chock full of useful new features that are thoughtfully implemented so the user won't suffer from information overload. The multiple undo and redo capability of the history palette and dynamic layer effects will be a boon to many users, though the euphoria from using these tools may be overshadowed by the learning curve demanded by the new color architecture. Rest assured, however, that this upgrade is well worthwhile. ❑

Peter Milburn can be reached at:
dfm.systems@home.com

Apple rolls out Mac OS X Server

Partial open source software, Darwin, also launched

CUPERTINO Calif (NB)—Apple Computer Inc. has introduced a new Macintosh operating system (OS), Mac OS X Server. The firm is hoping the software will help it regain customers using OS products built by Microsoft Corp.

Apple officials are touting the new server OS as a platform that combines the strength of Unix with the simplicity and user friendly atmosphere of Macintosh PCs. The OS represents a substantial upgrade from prior versions as the company has not done a major update on the program in well over two years. Mac OS X Server integrates tools from Next Computer Inc.'s Rhapsody OS. Next was founded by Apple chief executive officer Steve Jobs and acquired by Apple in 1996.

Apple is counting on the new software to power Macintosh based networks. While the company has had success in pulling in consumers with its new-generation iMacs and Power Macs, it is essential that it offer up progressive OS software in order to appeal to design firms and educational institutions as well as other organizational buyers. Later this year Apple is expected to release a major overhaul of its entire Mac OS family.

"Our customers are excited about Mac OS X Server, Apple's first modern server operating system," said Jobs, at the OS launch. "Mac OS X Server is an incredibly powerful Web server and by introducing it at an aggressive price of US$499, we're putting power into the hands of millions of Macintosh customers in education and business."

Apple is making Mac OS X Server available from resellers and from its online store for US$499 with an unlimited client licence.

According to Apple, the OS is built on a modern foundation with services designed for Mac-based Internet development, design and publishing, and education customers. One new feature of the product is NetBoot, a function that allows a network of Macs to be booted and configured from a single server.

Darwin

At the launch Apple also announced its Darwin OS. That product is an open source release of the Mac OS X Server operating system foundation. The software will be available free for developers at the Apple Web site over the next few weeks.

The open source software follows a development model in which programmers may use and modify the source code—that is, the human-readable computer programs from which the machine-readable binary programs are compiled—as long as their modifications are made available to other developers. The best of the changes eventually become part of the official software version, in an evolutionary process of a sort that the Apple software's name itself suggests.

Apple claims to be the first major commercial OS vendor to open up major portions of its system and to base its software strategy on the anticipated results. However both Silicon Graphics and Sun have recently made portions of their respective Unix operating systems available as open source.

Continued on page 93

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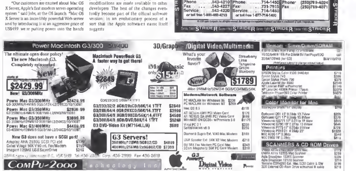
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Mac news briefs

New QuickTime for Java

CUPERTINO Calif (NE)—Apple Computer Inc has taken another step in trying to appeal to a wider audience of programmers and applications developers by introducing a Java-oriented beta version of its QuickTime software QuickTime is used for creating and publishing digital media and can now be used to build applications that use Sun Microsystems Java computing language.

Java, which was created as a write-once-run-anywhere platform has become increasingly popular among those designing programs for use on the Net. QuickTime offers developer tools for creating graphics, sound video text, virtual reality and 3D graphics for Macintosh and Windows-based computers

According to Apple the new QuickTime for Java release provides wide access to its applications design capabilities through an object oriented Java framework built around the QuickTime Application Programming Interface (API). The firm said since QuickTime is also part of the basis for the MPEG-4 file format, users can trust that software built using the program will be compatible with industry standards Apple said that it plans to include QuickTime for Java as part of a future release of QuickTime.

A beta copy of QuickTime for Java can be downloaded from Apple s Web site

QuickTime http://www.apple.com/quicktime/

Patent problems for ColorSync

CUPERTINO Calif (NB)—Another of Apple's programmer-oriented technologies continues to receive complaints regarding trademark infringement. A firm known as Imatec Ltd contends that the recently released version of Apple's ColorSync color management technology infringes on the patents it is currently defending in a pending court case between the two companies

Imatec said in mid-March that Apple s ColorSync 2.6 release has further encroached on its patents by adding a new monochrome profile characterization Imatec s patent infringement lawsuit against Apple recently concluded the discovery phase of the proceedings Both parties are waiting for the court to set a trial date

On Feb. 13 1998 Imatec filed a patent infringement complaint for US$1 1 billion against Apple in the United States District Court Southern District New York. The company is seeking a permanent injunction against Apple from marketing ColorSync

For its part Apple has declined to comment on the latest development in the Imatec suit The firm contends it has not infringed on any of Imatec s patents.

Mac Trainers back online

TOKYO (NE)—After a hiatus the Association of Macintosh Trainers—an international network of professional Macintosh computer trainers, educators and instructors—is back. If you re looking for a trained professional to teach you all about using Apple computers, check the database at this site

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Apple rolls out Mac OS X Server

Continued from page **91**

The increasingly popular Linux operating system which has been drawing developers away from Windows and Apple as well as from other Unix flavors, is developed entirely rather than partially within the open source model

Apple is not going completely to open source however In its announcement the firm said its first Darwin release includes the foundation layer of Mac OS X Server This layer includes the Mach 2.5 microkernel and BSD 4.4 operating system as well as core Apple technologies like AppleTalk, HFS+ file system and the NetInfo distributed database

Apple will coordinate the updates created in the open source model and make regular updates to Darwin available over the Web the firm said Apple will also promote the Web site as a forum for guiding and encouraging Darwin development

"The open source movement is revolutionizing the way operating systems evolve and Apple is leading the industry," declared Avie Tevanian Apple's senior vice-president of software engineering

Eric Raymond president of the Open Source Initiative and an influential voice among open source developers lauded Apple for embracing the open source model

In a statement Raymond said "Apple has a proud tradition of innovating in ways that shake up the computer industry They've done it again with this announcement The Open Source Initiative hopes that Apple's decision to open source its core OS code will point the way for other computer and systems manufacturers to open source their operating systems " ❑

Apple http://www.apple.com
Darwin http://www.apple.com/darwin

PC/Mac anti-virus software launched

ABINGDON U.K. (NF)—Sophos, the anti-virus software specialist has announced an integrated package for PC and Macintosh computers. The company says the multi-platform edition of its Sweep anti-virus technology is the first application of its type.

According to Sophos officials the idea behind the integrated version of Sweep is that it delivers a consistent approach to corporate anti-virus protection The software provides simultaneous cross-platform access scanning and software updates

The move to multi-platform support is the latest enhancement to the firm's Sweep anti-virus software for the Mac and extends the company's InterCheck virus-scanning technology already available for the PC over to the Mac platform.

"It's increasingly common to find cross platform environments sharing applications like Microsoft Office which are the main source for macro viruses " said Paul Ducklin head of research with the firm He added that it is vital that Macs are covered by exactly the same stringent security policies as other workstations

"Sophos Anti-Virus provides a consistent interface which makes life easier for both users and IT managers " he said

Sophos, http://www.sophos.com

PhotoDraw 2000 worth 1,000 words

Without the $1,000 price

By Ross MacDonald

Somebody must have been listening. Though largely positive in my comments about previous releases in the Microsoft Graphics Studio line of image manipulation software, my one consistent criticism has been the lack of sophistication that results in end products that consistently look home made.

PhotoDraw 2000
From Microsoft Canada Ltd.
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Tel. 905 568-0434 http://www.microsoft.com
Estimated Street Price: $239

My lament has been the dearth of imaging software to occupy the very wide chasm between the wealth of "consumer level" packages from a number of publishers and the highly professional packages from the likes of Corel and Adobe. Here, however, Microsoft has helped bridge that gap with a refined product that is an adjunct to Microsoft Office. In combination with that parent suite of applications PhotoDraw 2000 facilitates slick and professional looking graphical output (albeit not yet approaching the standards of Adobe's professional $1 000 programs).

Unfortunately—wizards notwithstanding—as the features and flexibility of a software package grow, so does the learning curve. Unlike Microsoft's Picture It!, Publisher and Home Publisher packages PhotoDraw 2000 is less than intuitive at the outset and requires some dedication before the impressive results it is capable of are forthcoming. Once along that road however, home and desktop publishers will be amazed at the difference between the graphics handled in PhotoDraw 2000 and those manipulated in other consumer level packages.

PhotoDraw 2000 can import photos and graphics from any digital source (scanner, digital camera, video input, and clip art), and in a number of alternative file formats, including AutoCad 2D, CorelDraw, GIF, JPEG, and even Macintosh PICT. Once you've acquired the image, you have considerable control over it before using it in just about any form you want. A bonus is that PhotoDraw 2000 allows you to work on text with the same tools and at the same time as you manipulate your photos and graphics.

As you might expect from a Microsoft product there are plenty of templates and wizards to make handling graphics easier and faster. Among the dozens of included templates are Web Graphics (including buttons and banners), Business Graphics (bulletins, flyers, labels, logos, and business cards), Cards (the greeting and email varieties) and Designer Edges (a catalogue of borders and outlines in various shapes and configurations). While many might never stray from the confines of these primary tools, it is more than tempting to start creating entirely on your own once you are familiar with PhotoDraw 2000.

A key to getting the most out of this package lies in its ties to Microsoft Office. You don't need to have Office installed on your machine to use this program, but if you do PhotoDraw 2000 will be added to the main directory as a a user-changeable default. This allows you to easily and "intelligently" import (including simply dragging and dropping) PhotoDraw 2000 graphics into any Office application. If desired, images will automatically be resized and reformatted to suit the space in the specified document. You can also use PhotoDraw 2000 to create a consistent look (colors, fonts, layout, etc.) for Office documents and files.

Though still a consumer-level package, PhotoDraw 2000 will appeal to the large number of computer users who want polished and professional looking output without having to spend the time and money professional packages command. Among the wide array of desktop graphics programs I now have in my library PhotoDraw 2000 is destined to be the most often used. Kudos, for a change, to Microsoft. ❑

Handheld PC briefs

Chinese input for Palm platform

HONG KONG (NB)—Hong Kong technology distributor Synergy and Motorola's Lexicus Division have announced the worldwide release of two enhanced versions of the DragonPen Chinese handwriting recognition software for the 3Com Palm family of products.

The DragonPen II and DragonPen EZ software systems, which recognize and display traditional and simplified Chinese characters respectively, are now available for the Palm V, Palm IIIx, Palm III, and PalmPilot platforms.

As the successor to the DragonPen software the DragonPen II and DragonPen EZ systems have an improved recognition engine with a smaller memory requirement. The new DragonPen II software allows users to input 5 401 traditional Chinese characters and an additional 564 Hong Kong characters (Hong Kong SAR Government GCCS Standard). DragonPen EZ software can accept input of 6 721 simplified Chinese characters.

Both software packages allow users to input data to the Palm family of products in the most natural way—with their own handwriting.

DragonPen software's recognition engine is derived from Lexicus' WisdomPen desktop software product. Motorola's experience with its WisdomPen software has allowed the new DragonPen products to exhibit high accuracy and input speed in a compact form suitable for the Palm platforms, the company boasts.

The DragonPen products' Chinese display capability is one of many products from Motorola's Red Dragon program which won the 1998 Hong Kong Industrial award for consumer product design.

Both DragonPen II and DragonPen EZ are available for download at the DragonPen home page or from Pilogear HQ for a suggested retail price of US$27.99.

DragonPen, http://www.dragonpen.com.hk
Pilogear HQ, http://www.pilotgear.com

DataViz brings Office files to Palm

TRUMBULL, Conn. (NB)—DataViz Inc.'s Documents To Go can now port files from Microsoft Office applications like Word and Excel to the Palm Computing platform, using HotSync technology. The program, now available for US$39, lets users view up-to-date versions of everyday files on any Palm Computing connected organizer, without specially formatted desktop files. Documents To Go creates the viewable files automatically.

DataViz, http://www.dataviz.com

Casio adds video, MP3 to PDA

TOKYO (NB)—Casio Computer Co. Ltd. says it has managed to pack a video camera and support for MP3 audio into a new version of its Cassiopeia handheld computer range.

The machine, which runs the Japanese version of Windows CE, will have a VR4121 RISC (reduced instruction set computer) processor from NEC at its heart. Its color TFT (thin film transistor) LCD (liquid crystal display) is capable of a resolution of 240 by 320 pixels and can display 65 536 colors.

Support for the MP3 digital audio standard is new to the machine and high quality audio playback can be enjoyed through a headphone socket. A megabyte of memory can be used to store audio but the machine also accepts Compact Flash memory cards adding to its usefulness as an audio player.

The video camera, which is an option on the base E-500 model but included in the E-507, is mounted on a Compact Flash card that slots into the top of the unit. Users can use it to take still or video images. The camera has a resolution of 350 000 pixels which ranks it on the low-end of the digital camera scale.

The new Cassiopeia E-500 will go on sale in Japan on March 26 and carry a price tag of 98 000 yen ($830). The E-507, with video camera, will retail for 125,000 yen ($1 060) and be available from late May. Combined production of both machines will be 10,000 units per month.

Casio recently launched models of its Cassiopeia range of handheld computers in the United States.

First Mini-PCI LAN card unveiled

SANTA CLARA, Calif. (NB)—3Com Corp. has delivered the first commercial Mini PCI (peripheral component interconnect) connectivity card, to Hitachi Ltd. An international standard for the tiny form-factor cards does not yet formally exist but Hitachi wants its new Flora 220CX sub-notebook PCs to use Mini PCI to connect to local area networks (LANs).

The Mini PCI LAN is also the first Mini PCI device to get Microsoft PC 98 certification, 3Com says. The company adds that industry demand has been building for smaller, more flexible and cost effective ways to link small mobile devices to internal systems. The design sent out by 3Com conforms to a draft Mini PCI specification authored by a vendor group led by 3Com and Compaq. The PCI Special Interest Group (SIG) expects to formally announce the specification this summer.

The Mini PCI card is an extremely small design functionally equivalent to a standard PCI expansion card. Part of the design's appeal lies in its ability to snap into position in a variety of system board locations rather than demanding valuable space on the outer edge. This gives hardware makers greater flexibility in system design.

The snap-in design also lets communications components be serviced locally, instead of requiring users to send an entire notebook in for repair.

The design will also improve time-to-market for vendors by letting them separate peripheral development from system development and will let vendors deliver built-to-order and configure-to-order systems more flexibly, proponents say.

Kip Meacham, OEM (original equipment manufacturer) product manager for 3Com's mobile communications division, described the Mini PCI based connectivity cards as representing a trend toward "highly customizable, yet affordable mobile computing solutions, especially in the corporate environment."

Ultimately, said 3Com, the open architecture design can be expected to drive down prices for peripherals by opening the market up to increased competition.

3Com, http://www.3com.com

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MAXTOR 4.3/6.4/8.4/13.6/17.2GB	$199/219/239/310/445
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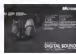
Great sound from MS speaker system

By Rod Lamirand

It is rare indeed that I run out and buy a computer product the day after I have reviewed it and sent it back Usually I discover that I don't really need the product or that there are better ones out there Sometimes I'd like to buy the product, and it may have been the best one I'd ever seen, but when it comes right down to it, I just can't part with the cash

Microsoft Digital Sound System 80
From Microsoft Canada
300-90 Matheson Blvd. W, Mississauga, ON L5R 3R3
http://www.microsoft.com/canada/
Estimated street price $239

However, I have just boxed up the Digital Sound System 80, which is a three-speaker USB product from Microsoft Canada and sent it back. Tomorrow I'm going out to get one of my own! Don't think I am new to computer sound—I just reviewed a six speaker digital Dolby system last month And don't think I've been using those tinny little computer speakers, like most of you have, all these years I haven't (In fact, until recently I used an old stereo amp and two large speakers) But the thing is you see, the Microsoft system rocked my world



Microsoft Digital Sound System 80 comprises a rather large subwoofer for the floor, and two nicely sculpted desktop speakers The connections are simplicity itself, a power cord from the wall to the subwoofer (the AC converter is hidden inside the car battery sized subwoofer) A USB plug also runs from the back of the computer to this 18 5x22.6x32 5 cm (7.3x8.9x12.8 in) speaker, which like most subwoofers lies unseen on the floor A cable runs to each of the two desk mounted speakers and that's it Almost

An analogue sound cable also needs to run to the back of your sound card. This is because not all sound can be sent digitally over the USB bus to your sound system If it could, and one day soon it will, you wouldn't even need the sound card As it is, DVD-ROM and CD-ROM drives cannot directly output digital information to your operating system. That's the reason why your CD and DVD-ROM drives always have an analogue cable that connects to your sound card. The problem is, even on the Digital Sound System 80 analogue sound doesn't compare well to digital sound

The digital sound demo that comes with this system contains three musical clips and three sound clips. The music is rock, classical, and jazz. The quality is amazing Because the information is digital it can and does, run through a small program that acts as an equalizer This means you can choose any one of 10 frequency bands and raise or lower its level. This means you can shape the sound to your liking. It is similar to what big sound studios do with a hundred levels, but on a smaller scale The sound effects samples are a helicopter and other examples that showcase the speakers' ability to make sound come from behind to the front and/or left to right. It is all quite impressive

However, if you play a game that sends data straight through to the sound card—rather than to the operating system into memory and processed as digital sound—it is played as an analogue signal so you can't use the 10-band equalizer and it doesn't sound as good The only good thing in this situation is that the installation program tests both the digital and non-digital nature of your CD or DVD drive If you don't hear sound when you test the digital ability of the player you simply connect the analogue cable

Microsoft expects this to change as more companies include the ability to output digital sound data from CD and DVD drives The company won't say how long this will take and it is far from clear on how all the pieces will come together Needless to say, Microsoft's game titles all sounded great with these speakers.

The Microsoft Digital Sound System 80 does not have the most speakers It isn't perfect, but for elegant simplicity, an uncluttered desk, and kick-ass bass. It's the one At an estimated price of $239, I will be picking one up today ❑

Check out the noise!

TCP reviews powered speakers for high-quality computer audio

By Graeme Bennett

No matter how great your sound card is, it's only going to sound as good as your speakers. As we wrote in our 1997 feature on speakers for multimedia many users find that a simple "aux in" connection to their home stereo provides a more than adequate sound system. However, for those craving more, there are a plethora of multimedia PC sound systems on the market

For this update on powered speakers we tested big box powered speaker systems from Sonigistix, Cambridge SoundWorks and Labtec We tested all these speakers with FutureMark's 3DMark 99 MAX, its demo mode as much a thrasher of audio system as it is a benchmark for graphics subsystems

Monsoon MM-1000
From Sonigistix Corp
http://www.monsoonpower.com
Price. US$295
Of these three "big subwoofer" systems, the Monsoon delivered by far the biggest bass. Its two "planar magnetic" satellite speakers were also the most unusual (at least to those unfamiliar with the company's background in automotive audio systems), being more or less flat. Each of the two 20x10 cm (8x4 in) speakers stands at a slight angle on a built-in base The Monsoon system is entirely black and includes a roughly 25 cm (10 in.) square containing a 12 5 cm (5 in) subwoofer with built-in volume bass and bass boost controls It also includes a wired remote volume and mute control—a nice touch Unlike the Henry Kloss speakers, the volume control affects both A and B audio inputs No microphone input or headphone output is provided

Overall, we preferred the audio from the Monsoon speakers although they did not handle excessive volume well A sharp digital clipping noise and an excessive degree of distortion was clearly audible when the speakers were pushed too hard Nevertheless, we recommend them, as most people are unlikely to use these high-quality units, or indeed any PC speakers at such extreme volumes anyway

MicroWorks by Henry Kloss
From Cambridge SoundWorks
Price US$249
The second-best sounding speakers tested were the MicroWorks speakers by Henry Kloss (from Cambridge SoundWorks) These small 7 5 cm (3 in.) cube satellite speakers and accompanying 20x20x35 5 cm (8x8x14 in) subwoofer come in PC beige They sounded almost as good as the Monsoon units at moderate levels and sounded better at high volumes Amplifier noise was a little more audible at extreme volumes. However, the amp/speakers did not exhibit clipping when pushed but merely degenerated the audio signal with a more typical type of "dirty" analogue distortion At more eardrum-friendly levels, they sounded a little less crisp than the Monsoon units, but were still excellent

A bass control on the back of the subwoofer controls the relative volume of the big cabinet's output. Our main complaint with these units is the fact that the wired remote volume control only affects one of the two audio inputs No microphone input or headphone output is provided

LCS 2632
From Labtec
http://www.labtec.com/products/LCS-2632.html
Price. US$99
Labtec's LCS-2632 is currently the top-selling computer speaker system in the U.S It is part of the company's so-called Audio F/X series and includes 3D "spatialization" circuitry to enhance a stereo sound signal

As might be expected, the output of the US$99 LCS-2632 was nowhere near as impressive as that of the pricier units reviewed here, but its highly functional design is likely to win over some consumers.

The Labtec system not only has an audio input jack on the back of the 20x10x35 5 cm (8x4x14 in.) subwoofer (all the units tested here use standard mini-jacks), but it includes microphone and headphone inputs on the front and a microphone signal output jack on the back

The Labtec system was also the only one tested here that featured 3D spatialization circuitry designed to provide extra "depth" particularly to CD audio and high-quality game soundscapes It fared less well in our 3DMark99 "subwoofer thrasher" tests frapping out at relatively low volumes with a "phhhhttttt" sort of attempt at the ultra-low notes that usher in the demo sequence

Other drawbacks for some people may be that this system has only one line-level audio input, and lacks remote volume control

However, we liked the included Clear Desk mounting brackets that allow you to hang the satellite speakers from the sides of a monitor

Multi speaker support
A growing number of audio cards such as the Diamond MonsterSound MX300, Sound Blaster Live! and Terratec EWS 64XL support more than two speakers. As well a number of DVD upgrade kits support multi speaker configurations. Thus a multi speaker setup is ideal for the best audio experience on these systems. ❑

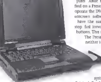
The search is about to begin
NB—SETI (the Search for Extra Terrestrial Intelligence) is about to launch its new SETI@Home software that will enable personal computer users to process data collected in searching for extra-terrestrial life. The software, which kicks in like a screen saver and uses your PC when you are not, could help you become the one who detects the first signs of extra-terrestrial life!
http://setiathome.ssl.berkeley.edu

Presario 1810 multimedia ready

By Rod Lamirand

The *Presario* line of notebook computers from Compaq Canada tries to hit a variety of price points with a varying range of features At $4,199 the Presario 1810 is on the higher end of this line and includes a big screen fast processor and an internal DVD-ROM drive (We reviewed the entry level Presario 1230 in the January issue of *The Computer Paper*).

Presario 1810
with 300 MHz Pentium II processor
From Compaq Canada
45 Vogell Rd. Richmond Hill ON L4B 3P6
Tel 800-263-5868 http://www.compaq.ca
Estimated retail price $4 199



User experience
Like the other Presarios, the 1810 is a good looking, sculpted machine with built in JBL speakers and touch pad. The 1810 sports a 300 MHz Intel Pentium II processor and a 13.3-inch TFT active matrix XGA display

The quality screen is a good feature as you are likely to want take advantage of its second generation DVD-ROM drive to watch movies I watched *Mask Fifth Element* and *Blade Runner* with the JBL speakers and with a headset and the experience was very good

It would have been hard to imagine a 6.4 GB UltraDMA hard drive even in a desktop computer just a year ago but the Presario has one The 1810 comes with a standard 64 MB of SDRAM which is expandable to 96 MB There is also an internal floppy drive internal V90 56Kbps modem and PC Card slots The graphics card has 2.5 MB of video memory

It is obvious that Compaq wants to sell this model primarily as a multimedia computer Aside from the usual buttons you find on a Presario there are extra buttons to operate the DVD drive Yes you can use the onscreen software controls, but you also have the easier option of pressing play stop fast forward rewind eject, or volume buttons. This is a nice touch

The Presario's keyboard is also good—neither too shallow nor too soft

Windows 98 comes installed in this Presario along with the usual collection of Compaq's own diagnostic tools The system comes with a Return to Original Configuration disk that will completely rewrite the hard drive and return the laptop to the original condition it was in when you first got it. I really like this feature It means you can muck around and if you go too far, you can use the disk and reinstall your applications.

Performance
I tested the Presario 1810 using Bapco's SYSmark 98 benchmark software. For various reasons I was unable to complete all parts of the benchmark and therefore cannot give an offical rating However, from the testing that was successful I was able to give the 1810 an unofficial rating of 105 That is not great compared with a new desktop machine (my 450 MHz Pentium III-based system scored 187) but is good for a laptop Informal tests on a 233 MHz-based IBM ThinkPad notebook produced a result of 75 while the Fujitsu notebook we tested last month, powered by a 266 MHz Pentium II processor scored 107

Summary
After using the Presario 1810 over a six week period in a number of different environments, I found it very friendly I like the Presario line of notebooks They are not cheap but neither are they CEO-only machines Attention has been paid to details that are important to the average consumer Support from the starting tutorial to the tech help and warranty are all good

When you buy a machine like this you pay a bit more for the assurance that the company will be in existence and willing to support its products should you need help If I weren't afraid of owning something that someone could easily walk off with I would buy one today If you can afford it and especially if you want to watch or show DVDs on the road the Presario 1810 is a pretty hot portable. ❑

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In the black

A compendium of black history addresses a spectrum of interests

By Ross MacDonald

With its move away from broad entertainment and the demise of its Home line of CD-ROMs, it's unusual to see a new release from Microsoft that is outside of the productivity utility or gaming categories But here as an adjunct to the company's extremely popular Encarta encyclopedia, we have Africana A Comprehensive Encyclopedia of Black History and Culture.

Encarta Africana
Comprehensive Encyclopedia
of Black History and Culture
From Microsoft Canada Ltd
320 Matheson Blvd W., Mississauga, ON L5R 3R1
Tel. 905-568-0434 http://www.microsoft.com
Estimated street price $109

Although an Encarta title, that larger encyclopedia software package is not required to use this two-disc set. Sharing Encarta's interface, however Africana makes it easy for both Encarta veterans and newcomers to move around and discover the contents of this "comprehensive multimedia encyclopedia of Africans and people of African descent."

Among the more standard features—like a media gallery interactive maps historic sites and virtual tours of the dark continent—Microsoft has mixed in interesting menu items like Africana on Camera and Topic Treks, and has even included a listing of academic credits of the 261 contributors and 36 scholars that constitute the Africana advisory board

The Africana on Camera section likely had the highest potential appeal, but it is largely unrealized This assembly of all too short (two- and three-minute) "statements" by prominent black Americans addressing different aspects of Africana's contents includes poet Maya Angelou speaking about the forced spread of Africans throughout the world, while United Nations Secretary General Kofi Annan summarizes Africa's past and future Also, curiously, included in this small gallery of prominent individuals are Whoopi Goldberg and Quincy Jones, who are at least more at ease in front of the camera than the other arguably more credible but decidedly more stiff commentators.

In Topic Treks there are guided tours through groups of related articles and multimedia clips oriented toward a variety of central themes like music and musicians or people and places One trek certain to garner a great deal of attention is Masters of the Game, an exploration of black participation in sports that includes historical accounts and the experiences of individual stars.

Overall, however, it is quickly obvious to anyone with a critical eye that Africana is a sanitized document, tainted by its clear agenda in favor of its topic. If Africana is to be believed, blacks and Black history have been essentially positive throughout the ages.

Former Ugandan dictator Idi Amin is listed, for example but the article outlining his biography and deeds is long on historical fact but short on profound interpretation "Rumored to have engaged in cannibalism as well as traditional Kakwa blood rituals Amin came to be viewed by many as both sadistic and irrational " This is akin to suggesting Hitler had anger management issues

Entries into the search engine for "tribal wars," "internal strife" or even "Black Panthers" all came up with a similar prompt "Black Panthers does not match any articles or filter that meet the filter criteria you have set "

This may not all fall at the feet of the team who created Africana however it is roundly acknowledged that internally Microsoft reference products are generally sanitized and simplistic in their approach perhaps in an attempt to increase marketability while mitigating any public outrage After all who has ever launched a high profile boycott of Bookshelf or Encarta on the basis of content?

Notwithstanding these generic shortcomings, Africana makes for a compact source of much general information that will at least enhance the libraries of those with anything more than marginal interest. ❑

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Multimedia Subwoofer w/2 Speakers
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Zoltrix PCMCIA 56K int. Modem	$89
Zoltrix 56K v 90 V/F/D ext. Modem	$99

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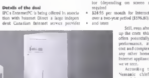
Enter the Net with a sub-$500 PC

Canadian manufacturer, ISP bundle full-featured PC with Internet access

By Jeff Evans

Since the "$500 computer" was first conceived of by Oracle Corp chief executive Larry Ellison several years ago there has been a battle for the hearts and minds of computer users On one side are boosters of the traditional Wintel or Mac personal computer, or PC, and on the other, fans of the network computer, or NC



A "true" PC offers choice and flexibility to its individual user It has disk drives so the user can load and delete whatever software he or she wants and it the system functions without being connected to a mainframe computer, server or the Internet A PC is more expensive than an NC because of the hard drive, the cost of managing software, the CD-ROM drive, and other multimedia and expandibility features A PC can also be particularly tricky and expensive for a non-techie to maintain, compared to an NC "appliance"

The "true" NC on the other hand, is targeted at saving organizations or individuals the costs of buying and maintaining full-featured PCs. The NC is supposed to be cheaper because it relies on a network connection to a server or mainframe system for access to software saving and loading files, and communicating via the Internet. Only an NC according to its supporters could be created cheaply enough to enable most of mankind to have access to the wired world of the future.

NC boosters claim that in order for many middle and lower income Canadian households to become "wired " the costs of a home PC would have to decline to absurdly low levels Only the NC would allow computing to become truly pervasive they said.

The EnternetPC

So we at *TCP* were understandably intrigued on hearing about the release March 25 of a $499 multimedia, Internet-ready PC from IPC one of Canada's larger PC makers. The specs for the product, called the EnternetPC include a 333 MHz Intel Celeron chip, 32 MB RAM, a 56Kbps v 90 modem, 3 GB hard drive, stereo sound card and speakers (monitor not included) We found it hard to believe that the raw components could be purchased for that amount, much less assembled into a functioning PC and supported with a warranty

Nevertheless, we contacted Basal Khalifa, national marketing manager for the IPC line. Khalifa explained that the continuing decline in PC component prices not only allowed IPC to sell a very capable PC for $499 but added, "you know what, they [prices] are going to continue to drop."

Details of the deal

IPC's EnternetPC is being offered in association with Internet Direct a large independent Canadian Internet service provider (ISP) Internet Direct is selling the EnternetPC as part of a bundle that includes a two-year, $24 95 per month Internet service agreement

At this point the nature of the business model behind the EnternetPC becomes clearer EnternetPCs are configured so buyers can simply power them up and they will connect automatically to the Internet The full costs for the EnternetPC bundle are

- $499 for the PC hardware,
- approximately $175 to $300 for a monitor (depending on screen size), if required
- $24 95 per month for Internet service over a two-year period ($598.80)
- and taxes

Still, even after adding up the costs this bundle offers potentially greater performance, at lower cost and complexity than any other home PC or Internet appliance system we've seen.

According to John Nemanic chief executive of Internet Direct "It's essential to eliminate the gap between the technology 'haves' and 'have nots. By working together IPC and Internet Direct have made Internet access and computer ownership affordable and easy for everyone."

The EnternetPC is being sold initially in western and central Canada—from B.C. to Ontario—with a rollout of the bundle expected in Quebec and the Atlantic provinces in the second quarter of 1999 ❏

IPC Tel. 888 446-4472,
http://www.ipc.ca/$499htm http://www.idirect.com

Antivirus tools developed for Linux

MOSCOW Russia (NB)—Kaspersky Lab, a Russian developer of antiviral software has announced the beta version of its AntiViral Toolkit Pro (AVP) for the Linux operating system.

During the past few years Linux has gained in popularity not only among a limited number of specialists, but also among a broad community of users. Yet up until recently, the operating system lacked a complete system for antiviral protection

AVP for Linux is based on the existing core which is used in the other AVP products. The core is also licensed for use in antiviral products of some other vendors, including Data Fellows (Finland), G-Data (Germany), and Vintage Solutions (Japan).

The new tool provides protection against more than 26 000 known viruses and malicious codes, including polymorphic viruses, stealth viruses, Trojan horses, HTML viruses and macroviruses. The product supports the most popular archive formats, antiviral email filtering, a new advanced algorithm for heuristic analysis, and an extended scanning mode.

Meanwhile, Kaspersky Lab and MediaLingua have announced a new joint project, the Viral Encyclopedia Webserver, which will provide Russian and foreign users with information on more than 14,000 viruses and ways of fighting them

The encyclopedia is available in both Russian and English and presents descriptions of the majority of the known viruses, peculiarities of their propagation and spawning, and effective means of their detection and elimination The site utilizes the search engine by MediaLingua, which allows requests in a "natural language " This helps the user to find the desired information based on viral symptoms For instance, a user could type "dropping letters," and the system will return a list of viruses which demonstrate such an effect.

Kaspersky Lab http://www.viruslist.com and http://www.avpve.ru

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Frippletown teaches reasoning skills

By Jean Allen Ikeson

Frippletown is the latest in Edmark's Thinkin' Things series which is popular with both teachers and kids because of its novel and entertaining approach to teaching problem solving and reasoning.

Thinkin Things Frippletown
From Edmark
Tel 800-691-2985 http://www.edmark.com
System requirements: Windows 95/98 Mac OS
For Ages 5-7
Price $45 (standard) US$59 95 (school version)

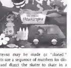
Frippletown helps to teach children how to follow directions distinguish between relevant and irrelevant information develop logical sequencing for problem solving, work backwards in deductive reasoning and find the "rule" that determines a pattern While all this may seem a bit pedantic, what it amounts to is Edmark's commitment to developing the cognitive or "thinkin'" skills in young children which are the basis for learning and dealing with a complex world.

Frippletown does what interactive multimedia educational CD-ROMs are supposed to do: it delivers learning and problem solving tasks in an innovative format, and its interactive elements foster problem solving in ways workbooks can't Only one-on-one interaction with a teacher or parent could be the equal to such CD ROMs. Using programs like Frippletown at home is one way parents worried about over-crowded classrooms can make sure their children aren't missing out

In one activity kids learn to use directions and follow a map to help deliver packages to Fripples around town Instructions are both graphic and oral to help children succeed at the tasks. They learn how to go north west, east and south along with forward, backward, left and right A map showing the movement of the Fripple van is always present in the upper left corner of the screen This way kids learn to associate maps with places and activities One-way streets dead-ends and detours keep the task challenging Children also learn that there is more than one correct route—in other words more than one way to solve a problem. This is probably my favorite activity and one that corresponds with the geography/mapping curriculum in Grades 1 and 2.

Making cookies and trying to get the recipe just right are the essentials in another activity that stresses deductive reasoning. If you choose the incorrect sequence, a balloon pops up with the image of what your cookie would look like and suggests that you give it another try

The idea behind the next activity Skate Park, is to show the relationship between numbers and shapes and how resulting visual patterns may be made or "skated" Students use a sequence of numbers for distance and direct the skater to skate in a curved or straight pattern As the path remains on the screen, a pattern develops that can be both artistic and geometric. At the same time kids must use more than one variable to plan their creation



In the third activity, children help Fripples design flags and decorate their town with them But Fripples insist their flags follow specific rules. So students must study the Fripple flags to determine what sorts of flag rules to follow and what information is irrelevant.

Teachers' aide

Teachers will appreciate the school version which includes a 102-page workbook filled with instructions for navigating the CD ROM, lesson plans, and related activities that reinforce much of what is taught in the program Many of the activities may be reproduced from the manual For instance a grid map in the manual provides the basis for drawing a map of the school in relation to the surrounding streets, houses or buildings, or of the halls in the school itself Another page shows the outline for a street sign that kids can fill in to complement an activity on mapping and touring their own school.

When teachers find software they think might work well in the classroom, they should always contact the manufacturer to find out if a school version of the program exists It s well worth the additional cost ❑

W3C proposes access guidelines

CAMBRIDGE, Mass (NB)—Charging that most Web sites don't provide adequate accessibility for users with disabilities the World Wide Web Consortium (W3C) released draft guidelines on how Web site designers and managers can provide better access to all Internet users.

The guidelines which were developed by the consortium's Web Accessibility Initiative, are aimed at creating greater awareness in the Web community of users who operate in contexts different from the average Web user, including persons who are visually or hearing impaired those who cannot use a keyboard or mouse and those using text only screens.

"The majority of large sites are not accessible to people with disabilities," according to Judy Brewer, director of the Web Accessibility Initiative. "There s not a consistent level of awareness yet among Web developers that it's important to maintain accessibility of their sites"

The W3C is an industry group that develops technologies used for the Web Its hundreds of members include AT&T America Online IBM Microsoft and SAP Implementation of the guidelines is subject to member approval.

The guidelines discuss accessibility issues and provide accessible design solutions. For example one way to make Web sites more accessible is by using style sheets to control font styles and eliminating the font element This gives HTML authors more control over their pages and makes those pages more accessible to people with low vision

Another guideline explains how content developers can make images accessible by providing a text equivalent that states the purpose of the image This would allow a blind Internet user with a speech synthesizer installed on his or her computer to understand the function of the image The total cost to the Web site designer has yet to be established, Brewer said

Other groups are also pushing for improved accessibility on the Web Disabilities Information Resources, a Trenton NJ based organization is urging Web site managers to voluntarily provide complete access to Internet users before anti-discrimination challenges arise in conjunction with the Americans with Disabilities Act.

"We don t think it's intentional discrimination but it would make more sense to address this before any problems arise," DINF spokesman Phil Hall said

For the most part Web sites large and small are unaware of the process involved in making their sites accessible and maintaining that accessibility Brewer said.

Jeff Thomas, director of marketing at iSyndicate admits accessibility isn't a top priority at the San Francisco-based Internet content service provider right now But he adds: "It's on our radar screen It seems like something we would ethically want to do The short-term answer is we aren't doing anything now. The long-term answer is it's definitely something we d want to consider." ❑

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In brief

*Continued from page **56***

File forms over the phone

MALVERN U.K. (NB)—Speech Machines has taken the wraps off its CyberTranscriber TalkForms service, which it says is the world's first speech-to-text service for filling out forms over the phone

Amanda Taylor, a spokesperson for the company, said the CyberTranscriber service runs on a Windows NT-driven set of servers located at the firm's U K. headquarters.

Because of the nature of the CyberTranscriber feature, Taylor said it does not matter where in the world the client company is located. Smaller client companies would have their calls routed from their own call centre to Speech Machines server. For larger companies—or if a client company's call centre is outside of the U K.—voice data can be captured and sent on to Speech Machines as a voice file Taylor said

According to Speech Machines, CyberTranscriber is unique in combining data entered by speaking "free form" text with data entered by keypad, and then sending it over the Internet for automatic upload into a customer's database. The client service is targeted at a range of form-centric tasks that traditionally require manual data entry, such as capturing names and addresses for customer orders and insurance claims forms.

Speech Machines, http://www.speechmachines.com

HP intros business greeting cards

PALO ALTO, Calif. (NB)—Hewlett Packard Co. has added two new sets to its Printable Expressions line of greeting cards The Boardroom Business Collection and the Watercooler Business Collection target the workplace and are designed to encourage personal communication between co-workers. HP sells each collection for about US$23 99 and a Greeting Card Replenishment Pack of 20 blank cards and envelopes for about US$14 99

HP-http://www.hp.com

Color MobileScan battery-powered

IRVINE Calif (NB)—I/OMagic Corp has announced the release of a battery powered MobileScan portable color scanner.

Targeted at mobile professionals and consumers with limited desk space, the 24-bit, full-page, sheet-fed device has a maximum interpolated scanning resolution of up to 9,600x9 600 dots per inch (dpi) It has an optical resolution of 300x600 dpi.

The device measures 4 3x5 6x28 5 cm (1 7x2.2x11 2 in) and weighs 540 g (1 2 lb) including battery, and ships with an AC adapter and a nickel metal hydride rechargeable battery that I/OMagic says can scan "about 60 pages on a charge." The software bundled with the scanner includes MGI's Photosuite and Xerox's TextBridge Classic OCR software

The parallel port scanner has an estimated retail price of US$200 I/OMagic says it is also planning versions with USB and infrared connectivity as well as a Mac version

I/OMagic http://www.iomagic.com

Novell previews 'digitalme'

SALT LAKE CITY, Utah (NB)—Novell Inc. has announced a digital identity system it says will fill the need for better control and use of personal information on the Internet

Dubbed "digitalme" the system builds on the firm's Novell Directory Services (NDS) as a tool to manage a user's digital identity including personal information and authentication of users. Authentication and privacy sometimes come into conflict as methods evolve for doing business on the Internet, but both are becoming ever more important for consumers and businesses alike Novell notes

Novell whose NDS system has been credited with turning the firm around financially during the past six months or so also announced support for its digitalme system from some financial heavyweights Citigroup and FirstUSA will test new services, collaborate with Novell to refine digitalme features and functionality and work with Novell to create open standards for Internet identity the firm said.

Digitalme uses a flexible software architecture and "card" metaphor to manage identity The virtual "meCards" include tools to let consumers create, personalize and manage their digital identities Since the user controls what information they share, they know when and by whom their identity information is being used says Novell

To make information management easier, the software can auto-register a user by filling in registration forms to establish access privileges on many World Wide Web sites A personal proxy system intercepts the forms fills them in for the user and provides a completed form for review When a user next accesses the Web site digitalme handles the sign in automatically

Ultimately says the firm it hopes digitalme will balance the interests of consumers who want control over their personal information with those of firms that want to increase customer confidence and their own brand identities by providing personalized channels and interfaces

Novell rite at http://www novell com

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JamC@m a digital camera for kids

By Keith Schengili Roberts

When I was about eight or nine, I was keen on photography. There seemed to be some special magic at work behind the pictures I took. But I only had the opportunity those few special times my father let me take a picture or two on his expensive Pentax reflex camera. This was in an era before the simple "point and shoot" cameras became widely available.

JamC@m
From Kidboard
Tel: 612-641-1006, http://www.kidboard.com
Minimum system requirements: Multimedia PC with 90 MHz Pentium CPU, Windows 95/98, 16 MB RAM, 90 MB of free hard-disk space (Microsoft PictureIt! 99), CD-ROM drive, active 9-pin serial port
Estimated retail price: $140

I ended saving up my allowance to buy a cheap, plastic "toy" camera that enabled budding young photographers like myself to take real pictures. The camera didn't have any of the bells and whistles of my father's Pentax, and the resulting pictures certainly weren't as good, but it kept up my interest in photography until I could afford a "real" camera.

This camera and the tools it comes with may give the budding young photographer a taste of digital photography

The new JamC@m from KidBoard is the digital equivalent of the toy camera I had many years ago. While its pictures are nowhere near the resolution seen in today's better digital cameras aimed at the general consumer, this camera and the tools it comes with may give the budding young photographer a taste of digital photography.

The JamC@m is about as "no-frills" as a digital camera can possibly get. There's no LCD preview screen, no flash and not even a proper lens. It's essentially a light-sensitive charge-coupled device (CCD) chip—much like that found in "real" digital cameras—surrounded by a hard plastic housing with a simple on/off switch and a shutter button. It has enough memory to take a grand total of six pictures at a relatively meager 160x120 pixel resolution with a color depth of 16 million colors (this is about one tenth of the pixel resolution typical of current "megapixel" digital cameras).

The camera makes a series of distinctive beeps to indicate if you have enough light for a decent shot, when you've taken a picture and to remind you that the camera is still on if you haven't taken a picture for a few minutes. All the prospective digital photographer has to do is point, click and hope for a successful "beep." The camera is made of a durable plastic, and is unlikely to break in the normal course of wear and tear a kid is likely to give it.

The software is about as easy to use as the camera. The camera comes with a diskette containing the TWAIN driver necessary to download the pictures from the camera, and a copy of Microsoft PictureIt! 99, a very easy-to-use graphic manipulation package—perfect for kids who know their way around a mouse and keyboard. Transferring the files from the camera to the computer is a snap using the software and a serial cable (note, however, that the computer must be running either Windows 95 or 98—parents who run Windows NT on their home PC will have disappointed kids).

One interesting feature is that the TWAIN driver allows the camera to take a picture every second or so, making the JamC@m a potential WebCam, though full software support for this use is not provided.

The pictures themselves are small and grainy—you can't expect too much from a picture that would be considered a thumbnail image in most applications—but the software makes up for this. Microsoft PictureIt! 99 comes with many simple but powerful tools that allow anyone to manipulate a digital image in a myriad of ways: put your face on the body of some superstar, create holiday theme cards that include your photo, and much more.

At roughly $140 (based on a suggested retail price of US$89), the JamC@m is a bit pricey, making it much more expensive in real terms than my toy camera from years ago. A kid would have to save her or his allowance for a long time to afford this. Having said that, however, the price is likely to go down over time.

Similarly, one could hope for a better picture resolution. The 160x120 pixel depth just doesn't provide enough detail for satisfying pictures, but this too is likely to change given time.

The toy camera is still a good idea in the digital age, and while this camera is underpowered, future versions will make this a worthwhile purchase that will keep your kids occupied for hours.

A tentative thumbs-up for the JamC@m. It's a very good idea, but I'd wait for a JamC@m 2.0 to come along with slightly better resolution at the same price-point. ❏

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Intel's HomePNA solution uses parallel port

SAN MATEO, Calif. (NB)—The new AnyPoint Home Network product line puts an end to hassles in homes with more than one personal computer, says Intel Corp.

The California chip-maker rolled out the new system, which uses existing home telephone lines to provide shared access to the Internet, printers, files and games.

Intel's technical marketing engineer Michael Jones said AnyPoint is the world's first external home networking product. He said Intel hadn't discovered the maximum number of PCs that could be networked through the system but they they had experimented with more than 20.

He added that the technology allows interfacing between PCs via phone lines even when the phone is being used for a voice conversation and that the software allows individual PC users to browse different sites simultaneously.

Intel's press relations manger Micki Fuller, reported that hands-on demonstrations were conducted in both New York and San Francisco and that response has been extremely encouraging.

AnyPoint is the first phone line solution that can be installed without opening the PC chassis, Intel says.

> AnyPoint is the first phone line solution that can be installed without opening the PC chassis. The system attaches to the parallel port of home PCs and Intel says the software is optimized for ease of use

The system attaches to the parallel port of home PCs and Intel says the software is optimized for ease of use.

Using AnyPoint, several PC users can share a single Internet connection.

Users can also share PC peripherals like printers and external storage devices, including tape back-up drives. Users can send files and messages from one PC to another, and engage in multi-player PC games from separate rooms in the home.

Dan Sweeney, Intel's general manager of home networking operations, says the product allows users to maximize the benefits of multiple home PCs. "It takes advantage of existing home wiring to provide a product that is designed to be simple, affordable and based on industry specifications."

The AnyPoint software automatically informs users when a new device has been added to the home network, and provides up to 1 Mbps of network bandwidth within the home.

The network products are based on the HomePNA 1.0 industry specification and are Year 2000 compliant. Data signals are transmitted on a higher frequency than voice signals so there is no interference with phone conversations. The system is also compatible with emerging, high-bandwidth Internet access specifications such as digital subscriber line (DSL) and cable modems.

The AnyPoint product line is available on-line from Intel. The line will initially be available in three packages.

The Parallel Port Model for two PCs has a suggested price of US$189, includes two external units, cabling to connect two PCs and their printers, and Intel's Internet sharing software.

The Parallel Port Model for one PC is also available at about US$99 and includes one external unit, the cabling to connect one PC and its printer and Internet sharing software.

A PCI adapter to be installed inside a PC is available at around US$79. ☐

Intel: http://www.intel.com/anypoint

Cable modem has IEEE1394 interface

TOKYO (NB)—NEC Corp. has announced development of a cable modem featuring a IEEE1394 interface—the high-speed home networking standard. A prototype of the device had its public debut at the WinHEC 99 exhibition in Los Angeles in early April.

The new modem is designed to provide a bridge between the ever-growing selection of personal computers and home electronics devices featuring IEEE1394 interfaces and the growing number of digital services being rolled out on cable networks, such as high-speed Internet access.

The Smart Cat modem offers a data transfer rate of 400 Mbps and supports transmission of Internet Protocol packet data over IEEE1394 through use of the new IP Over 1394 protocol.

An NEC spokesman said further development work on the device will continue with the availability of a commercial product targeted at later this year. ☐

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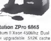

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Bleem second to emulate PlayStation

By Matt Hines

FOSTER CITY Calif (NB)—Another software emulator that allows PC users to play video games designed for Sony's popular PlayStation console has hit the Internet The latest PlayStation like program was designed by Bleem and is being marketed under the same name

The Bleem emulator joins Connectix Corp's Virtual Game Station as a low-cost product giving consumers access to hundreds of PlayStation video game titles from a computer's desktop

Bleem may also eventually join Connectix as a target of legal action from Sony, which has come down hard against third party PlayStation emulators Sony has declined to comment on whether or not it is considering legal action against Bleem

Sony was denied a temporary restraining order earlier this year that would have prevented Connectix from selling its system. But the PlayStation maker has vowed to continue fighting emulation programs

Unlike the Virtual Game Station which gives users of newer G3 Power Macintosh computers access to PlayStation games, the Bleem emulator offers the same ability to the widespread audience of PC users. Bleem claims its product will work with any 166 MHz or faster Pentium-based system

Bleem officials say on the company's Web site that they fear a lawsuit from Sony but feel within their rights in marketing their emulator

One defense Bleem is using is that the PlayStation is at the end of its product run and therefore its product won't steal any potential sales from Sony

For its part, Sony is planning to release PlayStation II next year, but is eager to point out that the new console will play games designed for the original PlayStation

Bleem is offering a beta demonstration of its emulator at its Web site, and is encouraging interested parties to let Sony know that they want emulators on the market Bleem is also hoping to build a defense for its technology by encouraging visitors to its site to let independent game makers know that emulators may drive future sales of older titles.

The main appeal of emulators is their relatively low cost While a new Sony PlayStation markets for about US$120, a Bleem emulator will only set you back by US$39 95 The company was expected to begin shipping its product by April 10

Connectix began shipping its US$49 Game Station in mid-January through its Web site and the product is also available at some Macintosh software and peripherals retailers The gaming system allows Mac users to play about one-third of the 300 titles available for PlayStation

Sony's console is one of the most widespread game systems in the world The company estimates some 30 million of the machines have been sold to date

Connectix officials meantime, continue to defend their company's right to compete with Sony for the huge market of people who buy video games made by independent developers.

Connectix spokesmen report that demand for the Game Station has been strong with the company fighting to keep up with a backlog of orders The system was introduced to the public at the Macworld Expo in San Francisco during January and Connectix claims to have sold more than 3,000 units of the product over the course of the week-long conference The Game Station works with Apple's G3 Macintosh computers, including desktops PowerBooks and iMacs ❑

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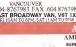

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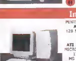

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IrDA software links Palms with pagers

DALLAS (NB)—JP Systems has unveiled a version of its BeamLink 2.0 IrDA software for the Palm III IIIx and V series of personal digital assistants (PDAs)

According to the company the software is highly flexible and as well as connecting the Palm series of PDAs to a notebook PC and other devices equipped with full duplex IrDA ports can also be used to interface to an IrDA-equipped two-way pager for access to email and other store-and forward communications.

Specifically the software allows users of the Palm series of PDAs to interface to Glenayre's AccessLink III two-way pager, which works across the SkyTel paging network

According to company officials, BeamLink 2.0 is the first software ever to enable infrared communications on the Palm V organizer through a two-way pager that can also serve as a wireless modem.

Dayakar Puskoor JP Systems chief executive officer, said the software is better than a follow-me message forwarding feature because PDA users now can send messages simultaneously to telephones, email addresses and pagers.

"We recognized that the majority of consumers have not yet consolidated their communications tools into one mobile device" he said, adding that given the surge of PDA users it made sense for the company to incorporate landline and wireless telephones as options for delivery of PDA user messages.

According to John Stupka SkyTel's president meanwhile, combining BeamLink 2.0 with the company's text to-voice conversion service allows PDA users to reach telephone users in a convenient format

"In addition, confirmation of message delivery and acceptance automatically are sent to the PDA user from our network," he said

As well as selling the software on its own for US$49.95 JP Systems is also selling a bundled package of an AccessLink II pager and the BeamLink software at the discounted price of US$239.95 ❑

JP Systems, http://www.jpsystems.com

Huge growth in cable, DSL modems

The number of cable modems sold in the Canadian market grew by nearly 240 percent in 1998 according to Toronto-based Evans Research Corp (ERC) The technology market research company also predicts that sales of xDSL modems will grow by more than 500 percent in 1999

In a report called *The Modem Market in Canada, 1997 2001* ERC says unit growth of cable modem market grew 237 percent, while the overall modem market increased by 21 percent over the previous year. The total value of the modem market in 1998 was $162.4 million

"One of the most exciting developments in 1998 was the rapid deployment of cable data services," says Albert Daoust author of the report Daoust also notes that "in response to the cable modem success the telcos will be quick to roll out xDSL this year." Daoust predicts sales of xDSL modems are projected to grow 507 percent in 1999 (xDSL refers collectively to all types of digital subscriber lines—the two main categories being ADSL and SDSL—which can offer speeds of up to 32 Mbps.)

Sales of notebook modems grew by 80 percent last year and the report attributes this to the simple fact that more notebook computers are being sold

One modem segment in decline is the external analogue modem of which 3Com is presently the market leader accounting for half of all external analogue modems sold in Canada in 1998.—*David Tanaka*

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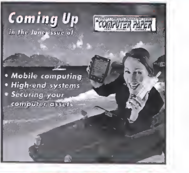
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The golden age of overclocking

'Good' versions of the 300 MHz Celeron A are getting harder to find

By Graeme Bennett

Celeron 300 at 450 MHz? Maybe

If you were one of the people who bought a Celeron 300 or 300A processor a few months ago—lucky you. There is a very good chance your processor can be overclocked to speeds greater than originally intended by Intel. (Please read our disclaimer.)

Since the Celeron 300A is "multiplier locked" at a value of 4.5, you can, with a motherboard that supports custom bus speeds, clock it to 4.5x66 (the 300 MHz default), 4.5x75 (about 338 MHz), 4.5x83 (about 374 MHz) or, if you are lucky, 4.5x100—a blazing 450 MHz!

Some people have even pushed their Celerons beyond this speed—a process we really don't recommend due to the increased likelihood of "electromigration."

Electromigration is a gradual deterioration of your CPU's core that occurs when chips run too hot. And just how hot do they get?

The typical temperature inside an enclosure is usually about 40 degrees C, depending, of course, on the room temperature and how effective your system's cooling fans are. If your computer's BIOS supports temperature readouts, you can expect to see motherboard temperatures of about 40-43 degrees C with a standard cooling fan (our Socket 370 Celeron came with a Jamicon chip-on fan) or about 10 degrees C cooler using a better fan and a thin layer of thermal paste, which helps transfer heat from the chip's core to the heat sink area.

Our "maxed out" gaming system with two SLIed (scan line interleaved) Voodoo2 cards, a TNT video card, Monster Sound MX300 and network card produces an ambient temperature of 44 degrees C, yet our Celeron 300A at 450Mhz still runs perfectly at its default 2.0 voltage.

Note, however, that such readouts are based on a temperature sensor mounted on the motherboard, not the CPU, so don't consider a number your BIOS gives you to be an accurate representation of the chip's temperature, which could be up to 25 degrees C higher (you'd need an on-chip heat probe to determine this exactly).

Intel says the maximum operating temperature of a Celeron processor is 85 degrees C. We think that BIOS-reported ambient temperatures over 45 degrees C are cause for concern.

Our PC.100 brand fan and heat sink combo cost us only $19, yet cooled a Slot 1 Celeron sufficiently so that our Abit BX6 motherboard in a well-ventilated case reported ambient temperatures consistently below 30 degrees C when running at 450 MHz. (For more detailed descriptions of these Slot and Socket types and other terms, see our Computer Glossary on TCP's Web site at http://www.tcp.ca.)

The most elaborate cooling systems are called Peltier coolers and they work like little refrigerators. Peltiers are more expensive than heat sink/fan combos, but they can decrease your CPU temperature by about 20 degrees C.

Good news and bad news

If you are just thinking of getting a new processor and you are considering one of these "overclocking friendly" chips, there is some good news and some bad news. The good news is Intel has retracted a message it posted on its Web site in mid-February that it was discontinuing the 300A. A couple of days later Intel changed the message. It now says it will continue manufacturing the 300A, although company spokespersons say they expect a rapid conversion to the PPGA version of the processor.

More good news: we've purchased both SEPP (Slot 1) and PPGA (Socket 370) Celeron chips in the last few weeks that overclock to 450 MHz without problems. The bad news is we've also been offered a number of chips that dealers are quick to caution cannot be reliably overclocked. Here's how to tell a "good" Celeron.

Our experience has been that the Socket 370 or Slot chips manufactured in Malaysia are more suitable for overclocking than their Slot 1 cousins from Costa Rica. Slot 1 Celerons from Malaysia are getting hard to find, but the Socket 370 versions (which typically come with a Slot 1 adapter card) are still readily available.

How can you tell where a Celeron processor is manufactured? Each Celeron has a sticker that indicates the date and place of its manufacture. On Slot 1 type processors this is a thin white label along one edge.

A Celeron manufactured in Costa Rica will clearly state this. In the case of boxed (retail) Celerons, the packaging will state this on the side. PPGA Celerons list the place of manufacture on the underside of the chip. Thus, if it is mounted in a socket, you'll have to remove it [illegible] to see the label.

Costa Rican Celerons are at this point not recommended for overclocking.

Disclaimer

Overclocking can damage your processor, motherboard or other components. Read our overclocking report at the TCP Web site for more info.

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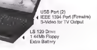

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Malaysian Celerons, however, seem to be more reliable—the Socket 370 chip we bought on Feb 27/99 overclocked to 450 at the default voltage (2 volts). By contrast, a Costa Rica Slot 1 Celeron bought a few weeks earlier required 2.2 volts to run stably at 450 MHz. In both cases, the chips were cooled with fans (with built-in heat sinks) and tested on an Abit BH6 motherboard—considered by many the best motherboard for overclocking.

We used a thin, evenly distributed layer of thermal paste to ensure the best possible contact between the processor and the fan/heat sink combo. The dealer we bought the Celeron from gave us a small vial of this thermal paste when we bought the chip and fan combo. (You may have to specifically request this extra item.)

You may also find that a utility such as Waterfall Pro from http://cpu.simplenet.com/eating_winlech/ can reduce temperatures. On one of our test systems, it reduced case temperature from 46 degrees C to 38 degrees C with no appreciable drop in performance and only a 100KB memory footprint.

What if your Celeron doesn't overclock to 450 at its default voltage? If you are using an Abit BX6, BH6, BX6-2 or ZM6, you can manually adjust the voltage. Increase it a notch at a time (few chips need to be pushed higher than 2.3 volts), until the chip runs stably. This little voltage trick is the reason avid overclockers love their Abit boards.

One more issue may rear its ugly head. If you get a Celeron, drop it into your motherboard's Pentium II-compatible slot and subsequently see a startup message that announces your processor is an "MMX-98 MHz processor" you have a problem that cannot be fixed without borrowing a (non-Celeron) Pentium II, inserting it and updating the BIOS of the computer in question.

Several popular motherboards we tested, including an Abit BX-6, Asus P2B-S and Legend-QDI BrilliantX IV motherboard, all needed BIOS updates before we could use them with Mendocino-class Celeron processors. □

Cache design boosts K6-III performance

In late February, AMD announced its fastest CPU yet, the K6-III. Early tests have shown that the new AMD processor, which costs slightly less than comparable chips from Intel, outperforms the Pentium II in general CPU performance but is considerably slower in floating point calculations.

However, according to Ace's Hardware, the K6-III's weak floating point performance has been negated somewhat in gaming/video applications by the addition of a so-called Write Merge Buffer and improved Level-2 cache design.

Ace's Hardware concludes that, while these improvements don't directly enhance FPU performance significantly, the improvements do have an effect on the other aspects of any application that uses floating point instructions.

Beyond the K6-III

Beyond the K6-III lies the K7—a radically new design from AMD, which, until now, has kept its designs compatible with the sockets used in Pentium-compatible PCs.

The new chip, due in mid 1999 at speeds starting at 500 MHz, does not use an Intel Pentium or Pentium II design system bus. Thus, AMD will have to persuade PC motherboard and companion chip vendors to build products based on this so-called Slot A design.—*Graeme Bennett*

Camino: Intel's next-gen chipset

Camino is the code-name for the next-generation chipset from Intel that may ultimately make obsolete many of the components found in the nearly new PCs sitting on many of our desks. Camino is expected to show up in PCs the second half of 1999. The following is a list of items in current PCs that are at risk:

1. **Memory** • Camino will provide memory speeds of up to 1.6 Gbps, thanks to Direct RAMbus memory, a plan Intel first announced back in December 1996. So say goodbye to your standard RAM, EDO SIMMs and other current memory types. However, 66 MHz or PC100 DIMM memory modules will still work. You may have troubles trying to use 66 MHz RAM on a motherboard taking advantage of Camino's faster 133 MHz bus speed, though.
2. **CPUs** • Camino supports a Front Side Bus speed of 133 MHz. Virtually all of today's CPUs are designed for 66 MHz or 100 MHz operation. It is also expected that Camino will be designed for the PGA (pin grid array) type of Socket 370 processors that include the Celerons released in January 1999. Slot 1 CPU owners may be out of luck, as will Socket 7 processor owners. If you're upgrading CPUs anytime soon and want to get one that will (probably) be compatible with the Camino-class motherboards that emerge in late 1999, the best bet is to get a PGA-type Celeron processor. There are adapter boards such as Abit's Slotket, selling for about $10, that allow these processors to be used in current Slot 1 boards, if desired.
3. **Motherboards** • Does your motherboard support 133 MHz? Didn't think so.
4. **Graphics** • Camino supports AGP 4x, which will boost graphics performance, especially when large textures are used. But today's graphics cards are designed for AGP 1x (33 MHz) or 2x (66 MHz plus textures handled in system memory). That means your old PCI or AGP 1x graphics card is another candidate for upgrading.
5. **ISA cards** • Camino is designed for PC99 specification compliance. That means no ISA slots. Many cards, such as modems and sound cards, won't even plug into the PC99 designs of tomorrow.
6. **Hard Drives** • Camino supports UDMA/66. Most of today's hard drives are designed for UDMA/33 or lesser specifications. That means a new hard drive for maximum performance.

—*Graeme Bennett*

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AltaVista may filter multimedia searches for copyright violators

PALO ALTO Calif (NB)—Compaq Computer Corp.'s AltaVista search engine and Internet portal subsidiary is entering the race to garner the interest of Internet users seeking multimedia files in expanding its site to include new areas designed to find audio and video clips online. Compaq/AltaVista could draw fire from copyright protection groups

AltaVista's new search service dubbed AV Photo & Media Finder was built with technology from Compaq's Cambridge Research Laboratory The tool provides users with the ability to search for photos, video and audio clips

According to AltaVista estimates, the search already features links to over 17 million distinct multimedia files

Among the formats the search engine will specifically seek out are MP3 RealAudio WAV AU for audio RealVideo QuickTime ASF MPEG and AVI The new function has grown out of AltaVista's existing AV PhotoFinder index of links to online photo images

While AltaVista officials expect to attract a significant number of new users through the expanded search capabilities the company could be opening a can of worms by advertising itself as a link to platforms such as MP3, which has drawn criticism from the recording industry

Recently, the Recording Industry Association of America (RIAA) threatened to take legal action against search provider Lycos, an AltaVista competitor for offering users links to MP3 clips that the RIAA says infringe on the record companies' copyrights

However AltaVista officials said they are taking notice of emerging and existing online copyright standards.

"The focus of the AV search is to provide a useful tool," said Tracy Roberts group product manager for search and communications at AltaVista "Users can look for MP3 files, but that is only a small part of the overall plan We're also making sure that we take any necessary steps to help protect copyrights"

Roberts said AltaVista would listen to any groups that feel the new search will help users find unauthorized clips AltaVista executives said they may even go as far as filtering for illegal files in order to keep groups like the RIAA at bay

Some experts believe RIAA will ask Lycos to begin sorting out any questionable links

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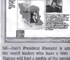

NB—Iran's President Khatami is among the world leaders who have a Web site. Visitors will find a profile of the president, the office of the presidency, recent news and decisions from the office an archive of past news and Web based discussion groups. Several pages and groups focus on Khatami's proposal to make 2001 the year of dialogue among civilizations

http://www.president.ir

Seeking

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Winners will be officially recognized with an award plaque during Comdex/Canada in Toronto in July. They will also be profiled in subsequent articles in *Canadian Computer Wholesaler* and *The Computer Paper*.

Nominations should include:

- Your name and contact information.
- The name of the nominee, business title, company and contact information.
- The reason for the nomination.
- Supporting documentation on the technology for which the nominee is responsible and an explanation of the role played by the nominee in the development of that technology.

Nominations can be made by any interested party. These nominations will be judged by a panel of editors from *Canadian Computer Wholesaler* and *Canada Computer Paper*. Nominations should be made no later than May 15, 1999.

Nominations should be addressed to: *Canadian Computer Wholesaler/Technically Excellent Canadians Award*. They can be sent by e-mail to: ccw@tcp.ca, by fax to: (463) 282-7482 or by mail to: The Editor, *Canadian Computer Wholesaler/Technically Excellent Canadians Award*, 501-425 Carrall St. Vancouver, B.C., V6B 6E3.

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Maximizing the bang for your new PC buck

How-to-buy-computer guides target three distinct groups

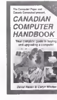
By Jeff Evans

The release of the Intel Pentium III processor has renewed the seemingly eternal dilemma of the new computer buyer Should I spend more money and buy the latest and greatest "power user" PC, should I settle for a cheaper slower more quickly obsolete model or, if I already have an older computer, should I invest money in upgrading it? We at *The Computer Paper* must confess a certain bias concerning this problem—much of our continued existence and prosperity as a publication depends on providing useful and honest help to our readers in making computer buying or upgrading decisions Nevertheless, while we'd suggest that readers continue to look to *The Computer Paper* for help in this process we'd also like to recommend three new books that are entirely devoted to the thorny problem of making the best possible computer buying decision

Canadian Computer Handbook

Authors David Rosen and Caryn Mladen
Publisher Media Access Publishing Inc.
Softcover 252 pages 1999
ISBN 10684108-84-3
Price $19 95

First on the list is the *Canadian Computer Handbook*, by David Rosan and Caryn Mladen We should state up front that this, the second edition of *CCH*, is sponsored by *The Computer Paper* and the *Canada Computes!* publications. Rosen is a long-time *Canada Computes!* contributor with years of experience writing about usability issues, while Mladen has a strong background in multimedia, online and legal matters relating to technology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David Rosen & Caryn Mladen

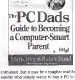
CCH is aimed at the first-time computer buyer and offers a clearly written, step-by-step approach to shopping for a computer, software and peripherals It includes a section in the introduction for the reader to write down comments on factors relating to the purchase, and the configuration of the system being purchased Almost three quarters of the book is devoted to explaining computer basics, including what you need in order to do tasks ranging from word processing running a small business playing games, or using the Internet The final section contains a nuts and bolts discussion of getting the best value for your money, including financing, health and safety and troubleshooting problems *Canadian Computer Handbook* makes the sometimes intimidating task of getting into computing an enjoyable new adventure rather than an intimidating chore

How to Buy a Computer Second Edition

Author Myles White
Publisher McLelland and Stewart Inc.
Softcover 286 pages 1998
ISBN 0-7710-8831-0
Price $19.95

Myles White's *How to Buy a Computer* covers some of the same ground as the *CCH* It is a well-written plain-language discussion of how to figure out what kind of computer you need and getting the best balance of price and performance. (White has also published *How Not to Buy a Computer*, an excellent guide to upgrading an old computer to add years of productivity before it needs to be replaced.)

However where *CCH* is written for a non-techie entry-level user who doesn't want to be overwhelmed by technical detail, *How to Buy a Computer* contains considerably more technical terms computer industry insider information, tables and detailed specifications and comparisons of computer products This makes it an extremely useful comprehensive resource for the budding computer enthusiast but it may be a tougher read for a newbie who simply wants to buy a PC to do some basic work or play and has no desire to become highly technically proficient Also, *How To Buy A Computer* lacks any illustrations or design frills It's packed with facts and although Whyte's chatty style is quite enjoyable, it is a very dense read for a beginner.



Continued on page **116**

Troubleshooting guide needs upgrade

Fourth edition misses new technology, but is a useful tool for older PCs

By Keith Schengili Roberts

Are you having problems with your PC but feel daunted at the prospect of lifting its lid to tinker with it? If so, you're in good company most PCs are serviced by technicians, if they are ever serviced at all But it needn't be that way The innards of your computer are comprehensible and with a bit of guidance you too can perform simple upgrades and repairs

While a lot has changed since the first edition of *Troubleshooting Your PC*, this book covers everything from ancient 286 systems running DOS to current Pentium based PCs running Windows 98 and NT

I have found that generally, any computer book that has made it beyond a single edition must have something worthwhile to say or it wouldn't be profitable for the publisher. And the information contained in previous editions of *Troubleshooting Your PC* has been useful enough to put this book onto the bestseller lists for computer titles

Troubleshooting Your PC, 4th Edition

Authors Jim Aspinwall and Mike Todd
Publisher MIS Press (distributed by Macmillan Canada Tel 416-963-8830)
ISBN 0-7645 7509-0
Softcover 834 pages 1999
Includes CD-ROM
Price $56 99

Rating

Information content: ***
Readability ****
Intended for: Beginner/Intermediate
Overall Rating ***1/2

The authors demystify the many acronyms that abound in the computer field, and include many diagrams and tips to help the average computer user The book begins with the basics CPU BIOS, video adapters sound cards, power supply and the other major PC hardware components It goes through the configuration problems you are most likely to face and takes a look at the various operating systems and their specific quirks It also takes a look at basic networking, troubleshooting hardware and software faults, and looks briefly at connecting to the Internet.

Unfortunately, this book has a number of holes in it, and despite the fact this is a new edition, it seems slanted towards older systems There is scant attention paid to non-Pentium chips produced by AMD and Cyrix (the index lists a single page for both)—an important omission as motherboards using these CPU chips have their own quirks and specifications It also doesn't cover PC 100 RAM or even mention the recently launched Pentium III chip

The authors do seem to have been resting on their laurels. However, if you have an older PC this book could be your salvation guiding you through upgrades and fixes that help keep your older system productive

Troubleshooting Your PC is a good book, but is already in need of an upgrade itself. ❑

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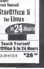

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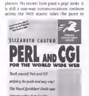
A show-and-tell guide to Perl, CGI

By Keith Schengili-Roberts

While the emergence of the Web has generally been hailed as a breakthrough in modern communications most Web pages typically have more in common with billboards than with telephones No matter how good a page looks it is still a one-way communications medium unless the Web master takes the pains to make it different. One way enhance to the exchange of information with Web site visitors is to install forms on a Web site. These allow visitors to leave comments fill out surveys or—if you run a commercial Web site—purchase items


ELIZABETH CASTRO
VISUAL QUICKSTART GUIDE
PERL AND CGI
FOR THE WORLD WIDE WEB
Teach yourself Perl and CGI scripting the quick and easy way!
This Visual QuickStart Guide uses pictures rather than lengthy explanations. You'll be up and running in no time!

Visual Quickstart Guide
Perl and CGI
for the World Wide Web
Author Elizabeth Castro
Publisher Peachpit Press (distributed by Addison Wesley Longman Tel 416-447 5101)
ISBN 0-201 35358 X
Softcover 272 pages 1999
Price $28 50
Rating.
Information content. ***
Readability ****1/2
Intended for Beginner
Overall Rating ***1/2

To make the communication flow both ways through your Web site, you eventually have to learn about the Common Gateway Interface (CGI) and Perl the programming language most often used to create robust, interactive sites. This *Visual Quickstart Guide* by Elizabeth Castro is a relatively painless way to get to know the basics of both Perl and CGI

The *Visual Quickstart Guide* series has hit on a winning formal much like the insanely popular *Dummies* series of books The basic formula makes extensive use of pictures accompanied by relatively concise descriptions that explain how things work. In the guide to CGI and Perl, the "pictures" are primarily lines of code with descriptions and the occasional Web page that shows how the code behaves CGI and Perl are relatively complex but this *Visual Quickstart Guide*—which is aimed at the beginner with little or no programming experience—manages to explain things clearly

It begins with a few pages on the basic building blocks of Perl, such as numbers, strings variables arrays and functions. It then goes on to explain how to create a very simple Perl script It looks at how to upload that script to a Web server and test it With this basic knowledge outlined the book dives into creating basic Web forms using Perl and looks more closely at arrays, creating conditional statements and writing subroutines to perform specific functions It also looks at how to effectively analyze the resulting data how to use cookies and how to track and debug errors in your code

This book covers a surprising amount of ground in just under 300 pages—and it does it effectively The show-and-tell approach does have its drawbacks what you get in breadth you won't get in depth But it provides a good overview of using Perl for the Web.

If you want to learn Perl and CGI this book is a pretty good start, and its detailed appendices will be a valuable resource even after your fluency in Perl takes you beyond this title ❑

Maximizing the bang for your buck

Continued from page **114**

The PC Dads Guide to Becoming a Computer Smart Parent
Authors Mark Ivey and Ralph Bond
Publisher Dell Publishing DTP Trade Paperbacks
ISBN 0-440-50843-6
Price: $20 95

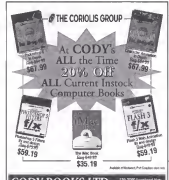
The PC Dads Guide to Becoming a Computer Smart Parent covers some of the same ground as the other two titles but is concentrated more on what parents should do after buying a PC for the family (It should be noted that the authors developed their *PC Dads* shtick while working for chipmaker Intel, so the book is based on the assumption that every family needs a computer)

The book reads like a long consumer magazine column on family computing, with the authors interspersing personal stories with comments from other parents. The layout borrows somewhat from IDG's *Dummies* series employing numerous illustrations and screen images to help convey information

There is a strong belief expressed by the authors in the educational value of home PCs In fact, there is a very middle class, upward-striving ethos behind this book Parents in the *PC Dads* universe are really really devoted to doing the right thing for their kids—which is not a bad thing at all

After acting as boosters for the positive side of computing, the authors then spend several chapters dealing with the hazards of the new technology, including the potential for addiction to violent games, how to protect minors from online stalkers porn and

Continued on page **117**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Nine Canadian history sites

By Keith Schengili Roberts

Canada is a large country with a long and interesting past. The Web has helped open up that history to a wider audience bringing to light different perspectives, previously hidden stories and providing more information on well-known events or information on historical areas. If you are delving into Canadian history these 10 Web sites are among the many out there that are worth a visit

1. **Oh Canada! Canadian History on the Internet** • This site is a good place

to start your walk through Canadian history Hosted by Beverly Leeck it provides an excellent listing, with accompanying descriptions of many of the more interesting Canadian history links to be found on the Web
http://www.macabees.ab.ca/canada/cachist.html
2. **The Avro Arrow Home Page** • This is the place on the Web for information about the famous Canadian jet interceptor airplane that was reputedly ahead of its time but dismantled under the Diefenbaker government. Since 1995, this page has been dedicated to the collection and dissemination of Avro Arrow information explaining what the plane was, key people who worked on it interviews and much more
http://www.televa.com/arrow
3. **Canadian Veterans Recollect** • Designed for students by students under the auspices of Industry Canada this site pays tribute to Canadian veterans who fought in World War I. It provides information not commonly found in history books and gives a voice to veteran's reminiscences through interviews that can be heard through RealAudio
http://www.schoolnet.ca/collections/vets/welcome.htm
4. **Women in Canadian History** • Though history tends to focus on great men. This Web site proves that Canadian history is full of great women who deserve a place in history as well. Susan Merritt the author of a couple of books on women's history created the Web site. It is designed as a resource for students

Continued on page 122

Maximizing the bang for your buck

Continued from page 116

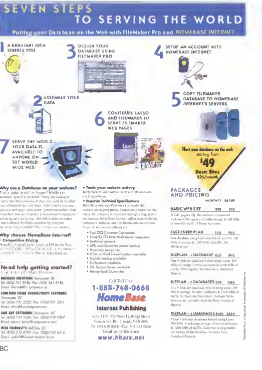
other vicious expressions available via new technology

Recommendations

In general I would recommend *Canadian Computer Handbook* to those about to buy their first computer who need all the basic facts but would be unlikely to need or benefit from in-depth technical information

From this reviewer's perspective *How to Buy a Computer* is for the more technically literate reader who would appreciate Whyte's vast knowledge and many nuggets of technical wisdom Whyte's book is also ideal for anyone buying a second or third computer

The *PC Dads* book is specifically for parents The good side is that it's really well thought out and full of practical advice The bad side is that to be a good PC Dad (or Mom), a parent will have to invest a few hundred hours of "quality time" learning and working with the kids on the family computer. In the age of instant gratification that bit of reality may be hard to swallow but it's a very basic truth of good parenting, whether or not computers are involved ☐



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Weaving your own Web site: Part 44

An in-depth look at Cascading Style Sheets: Part 3

By Keith Schengill-Roberts

We continue our in-depth look at Cascading Style Sheet (CSS) tags—and the differences in how they are displayed in both Netscape Navigator and Internet Explorer—with a look at the CLEAR, COLOR and DISPLAY elements.

The CLEAR element

CLEAR belongs to the family of CSS box and margin elements designed to tell the browser where textual elements should appear onscreen. The CLEAR element is used to set how the specified element will allow other elements to "float" along its sides determining where the text appearing after the element should appear. In this way it is not very different from the CLEAR attribute, which is used with the <BR> HTML tag and it works in exactly the same manner.

When text follows an image, it generally flows immediately after it in the same vertical space occupied by the image. Using the CLEAR CSS element you can control where text should appear in relation to the image. This can be handy when you have multiple images appearing on a Web page and you want to be sure your text is associated with the right image, and that the images don't appear in a jumble on the page. For example try entering and then viewing the following code in your browser:

```
<IMG SRC="image.jpg" ALIGN="LEFT">
This text should appear beside the previous image
<IMG SRC="image.jpg" ALIGN="LEFT">
```

What you will get is the first image appearing to the left, some text appearing to its right, and the next image appearing underneath the text and to the right of the first image. Not pretty. To solve this problem you could use <BR CLEAR="ALL"> after the text to force the second image to appear below the first, eliminating the jumble onscreen. You can now use the CLEAR element to accomplish the same thing.

The CLEAR element uses the following modifiers: LEFT, RIGHT, BOTH and NONE. LEFT tells the browser to display the text below the image when the image is set to ALIGN="LEFT". RIGHT tells the browser to display the text below the image when the image is set to ALIGN="RIGHT". BOTH should be used when you have two images aligned left and right and you want text to appear beneath both. Finally, NONE places the text between two images aligned left and right. The following code demonstrates all of these elements put to use.

```
<P>
<IMG SRC="image.jpg" ALIGN="LEFT">
<B STYLE="CLEAR: LEFT">
This paragraph should appear below the image text
is left aligned
</B>
<P>
<BR CLEAR="ALL">
<IMG SRC="image.jpg" ALIGN="RIGHT">
<B STYLE="CLEAR: RIGHT">
This paragraph should appear below the image text
is right aligned
</B>
<P>
<BR CLEAR="ALL">
<IMG SRC="image.jpg" ALIGN="LEFT">
<IMG SRC="image.jpg" ALIGN="RIGHT">
<B STYLE="CLEAR: BOTH">
This line of text appears <i>below</i> the two images.
</B>
<P>
<BR CLEAR="ALL">
<IMG SRC="image.jpg" ALIGN="LEFT">
<IMG SRC="image.jpg" ALIGN="RIGHT">
<B STYLE="CLEAR: NONE">
This line of text appears <i>between</i> the two
images.
</B>
```

Admittedly, much the same thing can be accomplished with less fuss using a table layout to arrange the text and image, but the CLEAR element provides an alternate way of doing things.

The CLEAR element is supported equally well in the latest versions of both Netscape Navigator and Internet Explorer. It is considered a "safe" CSS element to use.

The COLOR element

The COLOR CSS element is much easier to understand than CLEAR—it simply sets the color to be displayed for the HTML tag it is associated with. It can take either a color name (such as RED, AQUA or TEAL) or a hexadecimal color value. It works in the same way as the COLOR attribute does with the <FONT> tag or with a number of other HTML tags. The following code displays HTML and CSS code that produce the same results.

```
<FONT COLOR="RED"><B>Red, bold
text</B></FONT><BR>
<FONT COLOR="GREEN"><B>Green, bold
text</B></FONT><BR>
<FONT COLOR="BLUE"><B>Blue, bold
text</B></FONT>

<P>

<B STYLE="COLOR: RED">Red, bold text</B><BR>
```

Continued on page 120

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Weaving your own Web site Part 44

Continued from page **118**

```
<B STYLE="COLOR GREEN">Green bold
text</B><BR>
<B STYLE="COLOR BLUE">Blue bold text</B>
```

The COLOR element is supported in the latest versions of both Netscape Navigator and Internet Explorer and is considered "safe" to use

The DISPLAY element

DISPLAY belongs to the classification group of CSS elements. This is a powerful group of elements designed to fundamentally change the way an HTML tag is displayed For example, you can make a bulleted item appear as if it were a regular block of text, or make a blue hyperlink appear as regular text

The DISPLAY element has four values BLOCK INLINE LIST ITEM and NONE BLOCK sets the specified element to appear like a block-type tag like <P>, <H1>, or <BLOCKQUOTE> which are always on a line by themselves Contrast this to the INLINE setting which includes tags like <I>, <B> or <EM> that do not begin and end a line The LIST-ITEM makes the associated tag appear offset as if it were like a bulleted item in a list Finally, the NONE setting takes away the typical formatting normally associated with a given HTML tag

You might be looking at this and be thinking to yourself "big deal," and for the most part you are probably right But giving a tag the appearance normally associated with another can create some interesting effects. For example list elements are always indented from the left margin, and you could use that to your benefit, as the following lines of code show

```
<I STYLE="DISPLAY LIST ITEM">This italicized text
is indented in the same way a list-item would be </I>
<P>
<I>Compare this line to the one above to see the
effect.</I>
```

You can also force a header to appear within a line of regular text, as the following lines of code demonstrate:

```
<H1 STYLE="DISPLAY INLINE">This header</H1>
will appear within the sentence.

<P>

<H1>This header</H1> will appear on a separate line
than the rest of the sentence.
```

You can also force inline elements to appear on a separate line like a block element would do as the following line of code shows

```
The <B STYLE="DISPLAY BLOCK">bold text</B> in
this sentence will appear on a line by itself
```

Finally the NONE value makes the element it is associated with disappear completely, as the following code, when viewed, demonstrates

```
Now you see it, <B STYLE="DISPLAY NONE">now
you don t</B>
```

DISPLAY is a rather odd CSS element, since there are arguably better ways to accomplish much of the same effects with other CSS elements that would give you more precise control For example CSS provides better ways of setting margins for text than that used in the first example But this quick peek does give you an idea of what is possible with the DISPLAY element

There is partial support for this element in Netscape Navigator 4 5 (it does not fully support the INLINE value), and it is now fully supported in Internet Explorer 5 0 ❑

Next time The FLOAT and FONT CSS elements

Keith Schengili-Roberts welcomes any comments suggestions or HTML tips you may have You can email Keith at: robertsk@wave home.com Look for his recent book on HTML *The Advanced HTML Companion, 2nd Edition* co-authored by Kim Silk Copeland (ISBN 0 12 623542 2) now available in bookstores Previous articles in the series can be found at *The Computer Paper* Web site at http://www tcp ca/

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Nine Canadian history sites

Continued from page 117

teachers, history buffs and Net surfers and contains such features as Woman Of The Week and trivia questions.
http://www.niagara.com/~merwill

5. **The CRB Foundation Heritage Project** ▪ Yes, those people who create the series of 60-second "mini-movies" about notable Canadian people and events also have a Web site. The Web site is another extension of foundation's long-term educational program aimed at raising greater interest and awareness of Canada's history. Available in both French and English, students across Canada will discover a growing collection of electronic tools for researching Canadian issues, personalities, and events at this Web site.
http://heritage.excite.sfu.ca

6. **History Television** ▪ This is the Web site for the Canadian History Television channel. It is a slick site that provides plenty of information about its many shows, plus online games, extensive Web links, teacher's resources, discussion areas and more.
http://www.historytelevision.ca
7. **Klondike Visitors Association** ▪ This is a very professional site provided by the Dawson City tourism board. It contains plenty of information aimed primarily at people who want to visit the historic centre of Canada's great gold rush. You'll find extensive information on visitor services, listings of events, stories from the past and national historic sites in the Klondike.
http://www.hyperborean.web.com/kva
8. **Canada's Prime Ministers** ▪ Available in both English and French, this site contains descriptive biographies of the 20 individuals who have been prime minister of Canada. This site is part of a National Digitization Network, which plans to make this information available to schools across the country via the Internet.
http://cnet.unb.ca/achn/pm

9. **On This Day** ▪ Provided by Sympatico's NewsExpress service, this site provides a daily perspective of historical figures and events that shaped our country.
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CeBIT '99

Advances in mobile phone, set-top box technology top news at German show

HANNOVER, Germany (NB)—The world's biggest annual computer and technology show opened for business again in March. Spanning seven days and dozens of halls larger than a football stadium—even the press operations centre was larger than many exhibitions—CeBIT was big. Poring over the press statistics revealed that in terms of exhibitors and show goers this year's show was about 50 percent larger than Comdex Fall in Las Vegas.

Some 7,341 companies and organizations (compared with last year's 7,239) from 60 different countries showed this year's revolutionary advances and product updates to over 650,000 visitors from around the world.

Following are some news items and product announcements from CeBIT 99.

Web access for new Motorola phones
Motorola has promised Web access on all its new cellular phones by the start of 2000. Motorola believes it can achieve that goal thanks to the use of better graphics and microbrowser technology in its next generation cellular handsets.

Motorola has introduced the L7089 tri band phone, the world's first to support GSM 900, 1800 and 1900 wavebands, making it a true globetrotter. The phone, which will be available in the summer, supports a series of voice commands including dialling numbers, replaying messages and accessing voice mail.

As well as making all its new handsets microbrowser compatible by the end of the year, Frank Lloyd, Motorola's personal comms sector president for the firm's EMEA (Europe, Middle East and Africa) region said, Motorola wants to make all its phones wireless application protocol (WAP) compliant as soon as practical. "This means that consumers can expect to see the first Internet browsing capabilities appearing on a Motorola GSM phone by the end of the year and across our entire digital phone range in 2000," he said.

Motorola, http://www.motorola.com

Ultra-thin hard drive launched
While PC Card-connected hard drives have been around for almost as long as notebook PCs have been in stores, they have been relatively large devices. But Calluna has changed that with the launch of the first 260 MB PC Card Type II hard disk card.

Despite its capacity, the Type II Callunacard is just 5 cm (.2 in.) thick. According to David Buxton, Calluna's director of product marketing, the card extends the range of applications for miniature disk drives into mobile and handheld products, where the existing Type III drives are simply too thick. The Type II card is based on the technology at the heart of the 1 GB Type III card, since it uses the same recording head and the same disk as the Type III. Calluna says a new mechanical and electronic design has enabled 260 MB of data to be stored on a single-sided disk, allowing the firm to squeeze everything into the smaller case.

The card is expected to retail for about US$299 when its ships this spring.

Calluna, http://www.calluna.com

Nadio debuts InternetPrint
Nadio has taken the wraps off a software technology that allows the print button to be pressed on one PC and for the print to actually emerge on a PC or a LAN (local area network) on the other side of the world, the print image having been routed transparently across the Internet. The technology from the Fremont, Calif. based firm is called InternetPrint.

According to company officials, the software has been designed specifically for Windows 95/98 and aims to make Internet printing as easy as LAN printing. InternetPrint users can send to any remote printer that is connected to a computer with the software installed. It prints from any application, such as Microsoft PowerPoint, Adobe PageMaker, or a Web browser to any printer, including laser printers, color inkjet printers and multifunction peripherals.

Eric Huang, Nadio's product manager, said that Internet Print solves many of the problems caused by sending documents via fax or email. For example, he said, a fax machine can only deliver black and white documents with poor quality, whereas email is not instantaneous, has file size limitations, and requires

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One of the most interesting features about the package is that it is not specific to the printer at the local or distant end of the link, since it uses what Nadio calls a universal print driver that is built around graphic device independent (GDI) language.

To prevent task interception, InternetPrint incorporates a data encryption system to protect users' privacy In addition, to prevent Internet "spammers" from using InternetPrint to send out unwanted material, the software has a security option

InternetPrint requires at least a 486 66 MHz processor based PC running under Windows 95/98 with a minimum of 16 MB of memory The software ships next month priced at US$79

Nadio, http://www.nadio.com

Teknema box controls appliances

Teknema has taken the wraps off an Internet set-top box (STB) that interacts with a home network to allow users to control home appliances from their TV sets.

This may sound like a couch potato's dream, but the STB has the computer power to control many appliances within a home and bearing in mind that there are PC programs around already that perform this function, the inclusion of the facility inside an Internet STB is not as crazy as it first sounds.

For the unit, Teknema has partnered with BPT, the Italian electronic switch maker to develop a system for the STB to interface with the electrical wiring in a typical home

The STB communicates with devices also connected to the network using Echelon's LONworks technology According to Teknema, this allows the Internet STB to control various systems around the home, such as the heating system the lights, the security system and the power management of a house

Internally the Teknema Internet TV STB includes an 32-bit RISC multimedia chipset designed by ARM and manufactured by Cirrus Logic The STB also has an integral network interface flicker-free TV interface, a printer port smartcard reader, and a wireless remote control plus keyboard.

BPT http://www.bpt.it
Teknema http://www.teknema.com

Check in by mobile phone

A Nokia developer has revealed that the mobile phone infrastructure and handset firm is developing a new service in conjunction with IBM and Sabre, the online airline reservations system operated by American Airlines.

The system will be one of the first microbrowser-enabled services developed for the GSM/PCS mobile phone environment and will effectively extend the Sabre reservation system to a user's mobile phone.

As well as the more obvious booking facility for flights hotels and rental cars, for example, the mobile Sabre service will also feature pro-active information according to the Nokia representative For example, if a flight booked through the service is delayed the user can be alerted by SMS (short message system) text messaging.

Initially Nokia plans to offer the microbrowser-enabled version of the Sabre system for its own range of microbrowser-enabled smartphones, setting up its server interface to work across microbrowser and SMS text messaging links

The idea is that airlines can supply or recommend their frequent flyers to buy or rent a mobile phone and have access to the Sabre reservations system while on the move

According to Nokia plans call for trials among frequent business fliers to take place during the summer Although aimed at microbrowser-enabled mobile phone users, the plan is for the system to also be accessible using standard SMS-enabled GSM/PCS handsets allowing users to receive updates on their travel plans from the Sabre system on a regular basis

Nokia, http://www.nokia.com
Sabre http://www.sabre.com

Next generation vocoder unveiled

One of the most recent enhancements to digital mobile phones the development of enhanced full rate (EFR) codec technology is about to be leapfrogged by the arrival of a third generation codec/vocoder system known as adaptive multi rate (AMR)

EFR is a network-dependent feature that where available allows users to have access to near landline voice quality on their mobiles in exchange for a slightly greater use of available bandwidths.

AMR builds on EFR by dynamically allocating bandwidth to the call dependent on whether either party is speaking Instead of each digital mobile call being allocated a fixed bandwidth, calls are allocated bandwidth based on their actual needs and so when a person is speaking the call quality can actually exceed that of a landline phone call

VLSI Corp demonstrated what it says is the industry's first AMR vocoder for use on GSM/PCS Phase 2+ mobile phones.

According to VLSI the use of an AMR vocoder will really come into its own as the next-generation mobile networks start to arrive over the next few years VLSI says its AMR vocoder is now being offered to cellular handset vendors

VLSI http://www.vlsi.com

Mobile banking demonstrated

A group of four companies jointly demonstrated real banking transactions in a mobile environment at CeBIT 99

The companies involved in the demo were 1822.direkt the direct banking service, Schlumberger, the smart card firm Brokat which developed the software and Viag Interkom which drew all the other companies together and used its E2 cellular network to carry the transactional data

According to Viag officials, the transactional data is routed across GSM/PCS short message system text messages encrypting data flowing across the link to ensure integrity and secrecy The final security mechanism used in the Viag facility is the use of transaction numbers and PINs for each transaction

Viag said that by employing transaction numbers users can retain control of and access to their account across remote connections.

Company officials said using a simple menu-driven handset display users can initiate account transfers and request details such as an account balance or stock prices

The scope of Viag's pilot program will be expanded in the future to support additional applications. The firm said it envisages integrated services such as a mobile brokerage for buying and selling securities, replenishing electronic purses and building other information services around banking transactions

Viag said electronic banking is enjoying growing popularity in Germany 1822direkt a savings bank subsidiary says it already carries out over 70 percent of its transfers online.

For the CeBIT demo Schlumberger supplied a Java-based SIM (subscriber identification module) card the Cyberflex Simera, to guarantee the security of mobile banking transactions. The company also provided a server platform (Arezzo) that ensures local independent administration and a reliable continuous data flow over the Viag Interkom network.

If all goes well the four firms plan to start trials of the mobile banking service to selected 1822 direkt subscribers later this year.

Viag Interkom http://www.viaginterkom.de

Sagem shows mobile microbrowser

Sagem has taken the wraps off the cellular industry's first dual band microbrowser enabled mobile phone The phone the Sagem Dual uses Unwired Planet's UP.Browser technology

The microbrowser technology allows a mobile phone to access data on the Web, as well as allowing a cellular carrier to migrate users away from help and information systems that use up valuable voice channel capacity, and over to an interactive menu style system that uses data exchange instead

In a demonstration at CeBIT '99 Sagem officials showed how the dual GSM mobile interacts with a server accessible across a cellular network to view and reply to email, as well as gain access to personal organizer style functions

According to Sagem, by combining the microbrowser technology with its existing user interface software, the firm gives cellular network operators a new way to reach subscribers and add innovative services, with seamless integration of all voice and data features

According to Malcolm Bird Unwired Planet's European managing director, the firm's microbrowser technology is now involved in more than 10 active trials across the world

Sagem http://www.sagem.com
Unwired, http://www.uplanet.com

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games
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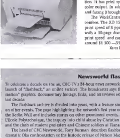
WHAT'S NEW

Xerox rolls out five SOHO products

Xerox Canada has introduced two multifunction devices and three digital printer/copiers that are aimed at the small office and home office market



The WorkCentre 385 is based around an 8 ppm (page per minute) 600x600 dpi laser printer, and has scanning, copying and PC faxing functions The 385 has a suggested retail price of $895

The WorkCentre 480cx is based on inkjet printing technology, and offers 1,200x1,200 dpi print resolution It has print speeds of up to 8 ppm for black and white and 4 ppm for color output. In addition to color printing, it offers color scanning, copying and faxing (through a PC) The 480cx is expected to sell for around $650

The WorkCentre XD155df, XD 105f and XD 103f are all copier/printer combos. The XD 155df will make 15 copies per minute and has a maximum print speed of 8 ppm It will sell for around $1,200 The 105f and 103f come with a 30-page document feeder They will both have an 8 ppm maximum print speed and can generate up to 10 copies per minute Both are priced at around $1 300 —*DT*

Xerox Canada Tel 800-832-6879 http://www.teamxrx.com

Newsworld flashes back

To celebrate a decade on the air, CBC-TV's 24-hour news network, Newsworld is letting viewers dig into its past with the launch of "flashback," an online archive The broadcaster says flashback will include Real Video news clips, "flash animation" graphics documentary footage, links, and interviews related to Canadian and international news events of the last decade.

The flashback archive is divided into years, with a feature story highlighting each year supplemented by sub-stories on other events. The page highlighting the network's first year on the air 1989 for example concentrates on the fall of the Berlin Wall and includes stories on other prominent events, including the murders of female students at Montreal's L'Ecole Polytechnique, the inquiry into child abuse by Christian Brothers at Newfoundland's Mount Cashel Orphanage, and the clash of student protesters and Chinese soldiers at Tiananmen Square

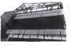
The head of CBC Newsworld, Tony Burman describes flashback as a video encyclopedia where students can "see the dramatic Oka confrontation or the historic release of Nelson Mandela" for the first time

The network is stressing flashback's educational qualities, and backs this up with promises to provide teachers with lesson plans that include classroom activities and suggested projects designed by a media literacy expert

According to the broadcaster, it is already enjoying online success with more than 1 5 million viewers logging onto the Newsworld Online site every month.

The new archive is expected to be online shortly after *TCP* goes to press.—*MJ*

flashback http://www.newsworld.cbc.ca/flashback



Pacific Plaza becoming PC nexus

While having only opened it doors about six months ago Pacific Plaza in Richmond has become home to a growing collection of computer hardware and software vendors and service providers The computer related businesses—Com Canada E-Tech Computers, Kilo Computer LTD Sydex Computers and Skybus Internet—are all on the third floor of the mall, which is located on Cambie just west of Garden City

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WHAT'S NEW

Handheld personal trainer

Physical Genius has announced the release of a tool it says will allow people to design, monitor and analyze their workouts.

The Physical Genius Home Trainer is a combination of PC software and a small handheld device called a Digital Training Assistant (DTA). The software allows the user to create a variety of simple to complex workout routines on a PC, which can then be downloaded to the DTA. During a workout, the user follows instructions on the DTA and uses it to record his or her performance. That information is later uploaded to the PC to chart performance and use in designing future routines.

The DTA is a compact and rugged device about the size of stopwatch or pager. Physical Genius says the seven-button device is as easy to operate as a basic cell phone.

The Home Trainer software includes a library of anaerobic aerobic and stretching exercises that can be used to customize a routine. Workout, routines and performance data can be exchanged with any other Home Trainer user via the Internet. Users can also download new routines from the Physical Genius Web site.

Physical Genius Home Trainer's minimum system requirements are a 100 MHz Pentium PC running Windows 95 (it also supports NT), with 32 MB RAM, a 1 2 GB hard drive, SVGA display, a CD ROM drive and mouse.

In addition to the PC software and DTA, the Home Trainer package includes a cradle and serial cable for transfering data and a power adapter. It has a suggested retail price of US$249.—*MJ*

Physical Genius, Tel 215-504 4397 http://www.physicalgenius.com

Vidcam uses MPEG-4 compression

MAHWAH N J (NB)—Sharp Electronics Corp has unveiled the wallet-sized VN-EZ1 Internet ViewCam a digital camcorder that uses MPEG-4 (Motion Picture Experts Group type 4) data compression to make its recordings Internet friendly.

The device will be announced officially at PC Expo in New York in June after which time it will be available in retail outlets.

The portable camera is specifically designed to send digitally recorded audio and video over the Internet. It is a full-featured camcorder that can capture up to 60 minutes of video on removable SmartMedia storage cards. The data can then be transferred to a PC for posting on a Web site.

Mike Lyons director of marketing for the mobile information systems division, says the new camera makes it as easy to post large video files on the Internet as it is to post still images. MPEG-4 data compression is used to shrink large files to manageable size and reduce download times from the Internet.

The palm-sized 147 g (5 2 oz.) camera uses an LCD screen instead of a viewfinder, with a rotating lens that lets users take pictures from various angles and positions.

Corel issues software amnesty

Corel Corp. has announced the launch of a program allowing users of older versions of WordPerfect who don't have a valid licence to obtain legal certificates for a suggested price of US$29.

The Corel Licence Program (CLP), announced in early March, will cover several version of WordPerfect.

In a press release, Corel's executive vice president of marketing, Jim Orban said users who obtain licences will be able to make use of the company's technical support services. "With legal certificates these customers will also have a legal base to upgrade into Corel's latest technology."

According to Corel, those customers who get a WordPerfect licence will be able to purchase the WordPerfect Suite 8 upgrade licence at the standard CLP price. In North America this promotion is limited to a maximum of 50 licences per customer.

Corel says people interested in the CLP should contact their local software reseller for details on licence and upgrade eligibility. An FAQ on the licence program is also available at the Corel Web site.—*MJ*

Corel http://www.corel.com/clp/clpfaq.htm

Sun ships shrunken Java browser

PALO ALTO Calif (NB)—Sun Microsystems Inc has launched its latest technology aimed at driving the Java platform into consumer electronics applications, including set top interactive television devices and a variety of hand held technologies.

The firm has made its Personal Applications browser available, delivering a stripped-down version of the Java platform designed to run in the smaller memory environments offered by cell phones and other devices. The technology represents the first offering borne of Sun's acquisition of Beduin Communications Inc which created the Personal Applications browser.

Sun wants Java to become the default operating environment for set top devices and a variety of portable applications and has already recruited some 300 developers who have licensed the technology.

Vendors including Motorola TCI and Sony have all vowed to bring new products to market utilizing Personal Applications browser, which promises to give devices the ability to access the Web as well as send and receive email. Among the future applications being proposed by Sun for the browser are inclusion in smart phones and car navigation systems.

Personal Applications Browser is just the first of a set of products acquired by Sun through the acquisition of Beduin, a Canadian company specializing in Java application technologies for the emerging consumer device market. Future Personal Applications software expected to follow the browser include an email and organizer tool.

Sun http://www.sun.com

What's New is compiled and edited by Jeff Evans Megan Johnston, Sharlene Myers, Keith Schengili-Roberts and David Tanaka

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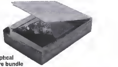

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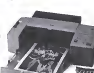

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Engaging games from After Dark

By Emru Townsend

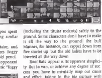
Is it me, or has everyone forgotten the purpose of a screen saver? I've never understood why anyone would have, say, a stock ticker that only appears on screen when they've left their computer.

After Dark Games
From Berkeley Systems
http://www.sierra.com
System requirements: Windows 95/98 or Power Macintosh System 7.5.5
Estimated street price $45

Berkeley Systems' new package, After Dark Games, is the latest culprit in screen saver modifications. You might say that Berkeley of all companies is allowed to do such a thing, since its wildly popular After Dark screen savers helped transform a boring

utility into marketable and entertaining eye candy. Still, as far as I was concerned when I received Berkeley's latest release, the name After Dark Games was a bit of a contradiction. However, I stopped caring after the first few minutes of play—After Dark Games sucked me in quickly and completely.

You see, I'm an old-school gamer. While I love space combat simulators, I'm not much for the twitch games that seem so popular these days, nor do I have the time for overwrought strategy and adventure games. I want to get in, blow something up or solve a puzzle and get out.



There aren't many explosions in After Dark Games, but for the most part the 11 games contained on the CD-ROM keep the mental gears turning.

Four of the games (Hula Girl, Mowin' Maniac, Rodger Dodger and Toaster Run) owe a considerable debt to early computer and arcade games. Most of your playing time is spent avoiding obstacles and picking up prizes. This can wear thin if, like me, you spent much of your adolescence playing similar games.

Foggy Boxes, After Dark Solitaire, and MooShu Tiles are repackaged oldies. Foggy Boxes is a digital version of an old pencil-and-paper standard: you and your opponent (the computer, playing the enigmatic "foggy

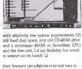
hand") alternately drawing vertices on an eight-by-ten grid of dots to make as many squares as possible. It's a simple, elegant territorial game, but it gets boring as there's only one type of grid available. After Dark Solitaire is a more aesthetically pleasing version of the Windows standby, and MooShu Tiles is an entertaining Mah Jong tile removal game.

Fish Shtick, Bad Dog 911, and Zapper are all pretty straightforward. The first two are puzzles that involve unscrambling words, and the latter is a trivia game. All have time limits that keep your neurons hopping. Zapper adds another wrinkle, giving players bonus points (and extra time) for correctly answering several consecutive questions.

But without a doubt, the star attraction of the After Dark Games collection is Roof Rats. It is the latest in the long line of Tetris-like games that can easily cut your computing productivity down to nothing. Generating more plaintive promises of "just one more game" than the other 10 games combined, Roof Rats has the same addictive arrange-the-blocks theme as Tetris, but in reverse. Here you remove similarly colored rooms from a building, in order to get the people and animals stranded on the roof (including the titular rodents) safely to the ground. Some characters don't have to make it all the way to the ground: the buff Marines, for instance, can rappel down from five stories up, but the old ladies have to be lowered all the way down.

Roof Rats' appeal is its apparent simplicity. But to win, or achieve any degree of success, you have to mentally map out cause and effect, taking in the big picture with every mouse click. The game is easily worth the cost of the whole package.

All the games in the After Dark collection have attractive graphics, cute animation, and can be customized to some degree—at the very least, you can choose the difficulty level for most of the games. After Dark Games also stores players' names and remembers high scores and settings for each game. Coupled



with relatively low system requirements (35 MB hard disk space, any old CD-ROM drive and a minimum 486SX or PowerMac CPU) and the low cost, I'd say Berkeley has another winner on its hands. ❑

Emru Townsend (emru@pobox.com) took twice as long to write this article because he had to peel his wife away from Roof Rats.

Best of the best software

NB—The Software Publishers Association presents awards every year for excellence in software known as Codies. This year, after it merged with the Information Industry Association, the awards have been presented by the newly amalgamated Software and Information Industry Association (SIIA), which grew out of the merger. The Web site provides details of the awards and all the winners and provides a great list of software worth checking out.

http://www.siia.net/conf/codieawards/98winners.htm

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Archive managers slice, dice, compress and restore your files

If you are new to the Internet, you'll find yourself bewildered by the wide range of free and trial software available online. The first piece of software you'll need is an "archive manager" so you can open and decompress all the programs you want to try.

Archive managers let you compress and decompress your own files as well, making them smaller for uploading, downloading, putting on disk, etc. To decompress a file to make it usable again, you usually need a decompression program that is the same format as the program used to compress the file. There are many different formats of compression. Currently ZIP is the most popular, but other formats such as ARJ, RAR, and even LHA and ARC have their adherents.

File Chopper

🐄🐄🐄🐄

Version: 2.6
Revision date: Feb. 14, 1999
Filename: FileChopper.exe
Byte size: 557,416
Licence type: Shareware
Cost: $12
Home page: http://home3.swipnet.se/~w-30005/
Also available: Windows NT Version

File Chopper is designed for moving files that are too large to fit on one floppy, SuperDisk, SyQuest cartridge, email, or other transfer medium. This program splits the original file into smaller files, then later restores the large divided file. File sizes can be chosen by the user or the program determines how much space is available so you can use partially filled or even partially corrupt disks.

FreeZip

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Version: 1.4.7
Revision date: Feb. 9, 1999
Filename: freezip.exe
Byte size: 287,600
Licence type: Freeware
Home page:
http://www.ozemail.com.au/~nulifetv/freezip/
Also available: Windows NT Version

FreeZip is a small, fast and efficient zip utility for compression and decompression of files and directories in Windows 95 and NT 4.0. FreeZip integrates with Windows Explorer and uses file associations and context menus to zip or unzip files. This includes long filenames and subdirectories. If you know how to use Windows Explorer, you can use FreeZip. The setup involves a single-click, with no options or settings involved.

NetZIP DELUXE

🐄🐄🐄🐄🐄

Version: 6.51

Revision date: Feb. 19, 1999
Filename: NetZIP.exe
Byte size: 1,589,561
Licence type: Shareware
Cost: $29.99
Evaluation period: 7 days
Home page: http://www.netzip.com
Also available: Windows NT Version

NetZIP Deluxe 6.3 is a suite of utility programs that automates downloading, unzipping and installing files. This Web browser plug in has changed the way people download files from the Internet. NetZIP automatically downloads the file when a user clicks on a .zip or .exe file. The user can then scan the file for computer viruses. Files can be installed directly from the browser, so the user doesn't have to exit the browser, find the file and launch a ZIP utility.

PKZIP for Windows

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Version: 2.60.03
Revision date: Dec. 2, 1998
Filename: pk263wop.exe
Byte size: 926,316
Licence type: Shareware
Cost: $49
Home page: http://www.pkware.com
Also available: Windows NT Version

This utility compresses files an average of 50 to 70 percent, and up to 90 percent with large text and database files. PKZIP for Windows can also create self-extracting .exe files. Other zipping features include the ability to create UUencoded files, span multiple disks when creating large .zip or .exe files, run an executable file from within PKZIP, add files from multiple directories, list file support, and choose from five levels of compression. Unzipping capabilities include viewing and extracting from TAR, GZIP, BinHex, MIME, UUencoded and XXencoded files, to unzipping by file size, date, name or type, and automatically executing a 32-bit CRC.

TurboZIP

🐄🐄🐄🐄🐄

Version: 3.01.17
Revision date: Feb. 7, 1999
Filename: tzpostlb.exe
Byte size: 1,425,408
Licence type: Shareware
Cost: $49.95
Evaluation period: 30 days
Home page: http://www.pgbc.com/turbozip
Also available: Windows NT Version

TurboZIP has command-line support and unattended auto-backup. It's a very powerful program that's more than just a zip/unzip utility, it's a whole compression-file management utility. Sure you can do the standard zip/unzip, but it can also scan your drives for zip files and list them in a window on the left. Click on the zip and it shows you the contents on the right, click on the file (still in the zip) on the right, and the autoviewer displays the file below, even animated GIFs are supported with the auto-viewer! You can also work with TAR, TAZ, base 64, MIME, UUencoded files and more. TurboZIP is very fast, easy to use, and powerful.

WinZip

🐄🐄🐄🐄🐄

Version: 7.0 SR-1
Revision date: Oct. 24, 1998
Filename: winzip70.exe
Byte size: 943,940
Licence type: Shareware
Cost: $29
Home page: http://www.winzip.com/tucows
Also available: Windows NT Version

The most popular compression/decompression utility for Windows, WinZip has an easy-to-use and fairly configurable interface. It works quickly and adds items to the right-click menu in order to easily compress or decompress files.

Mac Picks

Compact Pro

🐄🐄🐄🐄

Version: 1.52
Revision date: Jan. 5, 1999
Filename: tucows_compactpro.hqx
Byte size: 291,123
Licence type: Shareware
Cost: $25
Home page: http://www.cyclos.com/compactpro.htm

Compact Pro is a compression program that supports archiving. The algorithm typically reduces files by 50 percent. It provides automatic segmentation for archives that won't fit on a single floppy and has an option for self-extraction. This version updates documentation from the version released in 1995.

MindExpander

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Version: 0.92
Revision date: Feb. 3, 1998
Filename: tucows_mindexpander.hqx
Byte size: 267,021
Licence type: Freeware
Home page: http://www.mindvision.com/consumer/

MindExpander will expand all popular Internet files. It has built in support for MacBinary, BinHex, StuffIt, etc. It's a nice alternative to other compression utilities and best of all it's free. (Note: At press time MindExpander did not support Zip files, but the company says it will offer Zip support in the near future.)

StuffCM

🐄🐄🐄🐄

Version: 2.5
Revision date: March 8, 1999
Filename: tucows_stuffcm.hqx
Byte size: 230,756
Licence type: Shareware
Cost: $20
Home page:
http://www.kagi.com/dathorc/stuffcm.html

The Plug In StuffCM is a contextual menu plugin that works with Aladdin Systems StuffIt Engine. It can stuff, unstuff, convert, BinHex, segment and join files directly in the Finder through the contextual menu commands. To install StuffCM, drag it and StuffCM Control to your System Folder (they will be routed to their respective folders inside the System Folder) and restart your computer.

StuffIt Expander

🐄🐄🐄🐄🐄

Version: 5.1
Revision date: Feb. 7, 1999
Filename: tucows_stuffitex.hqx
Byte size: 2,980,307
Licence type: Freeware
Home page: http://www.aladdinsys.com/

StuffIt Expander is an award winning freeware product, and the most popular archival manager for the Mac. StuffIt Expander decompresses and decodes files downloaded from the Internet, sent via email or delivered on a floppy. Expander is simple to use, and works seamlessly with Internet browsers such as Internet Explorer and Netscape's Navigator. Just drag and drop a compressed or encoded file on StuffIt Expander and the application accesses the file automatically. ❑

Receive the *Guardian* by email

NB—MailMe, a well known email based news service has launched a service for the U.K. The company is offering news headlines and summaries provided by *The Guardian*'s Internet sites by email. The email bulletins which include URLs to the full articles are drawn from *The Guardian*'s News Unlimited, Football Unlimited and Cricket Unlimited sites

http://www.mailme.com

Official Dali Web site

NB—The official Web site of the Salvador Dali Museum in St. Petersburg contains a complete online gallery, information on upcoming exhibitions of his work, details of his films, articles on the famous painter and more. At present, the site features an online preview of an upcoming exhibition complete with three works you'll only see online!

http://www.daliweb.com

Mysteries of the Nile

NB—Follow a team of archeologists, architects, and engineers as they attempt to determine how the ancient Egyptians were able to carve, transport and erect giant granite pillars known as obelisks. View stunning QuickTime VR movies from Egyptian tombs, access dispatches from the site and read interviews with leading Egyptologists

http://www.pbs.org/nova/egypt/

ACLU says defend your data

NB—The American Civil Liberties Union (ACLU) has launched a Web site that puts the focus on privacy and data protection. While the site is U.S. based, it features several elements of interest to any Web surfer, including: a complaint form where individuals can spell out their privacy horror stories, a tool that shows individuals just what can be learned about them on the Web; a survey and postcard utility; and a discussion forum.

http://www.aclu.org/privacy

Living in space

NB—While colonies on other planets may be some way off, scientists at NASA are already looking into the idea of living on another planet and how it might be achieved. This Web site will provide you with some information about some of the current thoughts of NASA workers, complete with information on some of the support systems and controls needed for such a project

http://augusta.msfc.nasa.gov/ed61/
papers/rp1324/rp1324.html

Digital Age online

NB—Styling itself as the portal site for people who weren't born yesterday, Digital Age Online offers a new perspective on Web portals. "Regular people have gotten lost between the 'geek speak' of Web programmers and the overkill of so-called Web portals. Our site streamlines the online experience," says the Web master. Not only are there links to Web sites but easily accessible help on computer and Internet use, jargon, computer products and more

http://www.digitalageonline.com

The Dating Game online

NB—Based on the classic and ever popular hit television game show, Sony has unveiled an online version of *The Dating Game* on its entertainment driven Web site, Station@sony.com. The new game, which is

produced by Sony Television, joins online versions of *Jeopardy!* and *Wheel of Fortune*

http://www.station.sony.com

History of the light microscope

NB—You probably used a microscope, one of the most important tools in science, at school but you probably don't know that much about its history. This page will unveil all with a history of the tool which began with a simple lens in ancient times and progressed to the compound microscope in 1590 and the more advanced models of this century

http://www.utmem.edu/personal/thjones/
hist/hist_mic.htm

Virtual Vienna

NB—An extension of Vienna into cyberspace, this Web site serves both the local and international audience with news and information about the city and Austria in English. Targeted at people who live in the city or are thinking of making it their home, the site is packed with useful information for daily life

http://VirtualVienna.hypermart.net

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**[illegible] with minimum 1 year contract. Roaming charges may apply

U.S. study predicts rapid boom in home networking

SAN FRANCISCO (NB)—According to Gartner Group unit Dataquest home networking in the U S is in for a boom that will see the industry grow to US$2 billion in 2002 Driving the market will be fast connections to the Internet say Dataquest officials

John Armstrong vice-president of the networking worldwide program in Dataquest s telecommunications group said the forecast focused on the home portion of the U S small office/home office (SOHO) market

"Out of the approximately 100 million households in the U S today our forecast is that in the year 2002 there will be 6 2 million households actually networked " Armstrong predicted "The value of that market in the year 2002 will be in excess of $2 billion That's a rather substantial market "

He added "That s out of a total of 33 million multi-PC households So you can see there's a lot of headroom there another 27 million households that could be networked so we expect the number of networked households will continue to grow through the next decade "

Armstrong said networks will begin to arrive in what amounts to "productivity clusters" centered around PCs as people begin to connect an assortment of external devices to their computers He cited printers and scanners as examples

Over the next several years said Armstrong phone line networking will become the dominant connection technology followed by wireless traditional Ethernet and finally power line technology

The drive toward home networking will pick up steam—in fact be driven by—the accelerating arrival of fast connections to the Internet including the different flavors of digital subscriber line (DSL) phone connections and cable modem connections as voice-over Internet Protocol (VOIP) entertainment and interactive data streams converge in the home

Armstrong also predicted that the dominant home network operating system will be Sun s Jini the Java-based network system announced last July followed by Microsoft s Universal Plug and Play technology He said Jini will be favored because it is platform independent but Microsoft will be a strong player "because of its sheer presence "

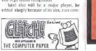
A third operating system Cisco Network s IOS core is likely to dominate in the Internet gateway area where homes interconnect with the new high-speed Internet connections now being rolled out said Armstrong

In terms of vendors Armstrong predicted 3Com will dominate by leveraging its current local area network (LAN) and wide area network (WAN) strengths coupled with its strong retail and channel presence and high brand recognition

Intel also will be a major player, he added simply because of its size, core competencies, market presence and tough competitive nature Intel has already targeted home networking as an "area for success " noted Armstrong

Diamond Multimedia also has a chance at success in this arena primarily because of the high brand recognition it shares with Intel and 3Com he added Trailing because of lesser consumer recognition will be Nortel's Bay Networks and Cisco which may prevail at the gateway but which are less known in retail space

Declared Armstrong "We believe this is a very exciting emerging market that will play directly into the home If you consider the types of households with multiple PCs in the homes we re talking about an affluent set of consumers almost an elite group You can expect to see lots of other high-value services to be delivered to this market as it expands " ❑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Feed your need for speed with two new racing sims

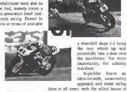
By Gordon Goble

We computer gamers certainly love our automobile racing, as evidenced by the wave of racing games being released over the last year or so. While two of the most hyped new titles come from the same publisher, Electronic Arts (EA) they're worlds apart in terms of quality and long-term playability

The astounding Superbike World Championship a motorcycle racing simulation is my personal early pick for racing game of the year However the second game NASCAR Revolution is a curious arcade simulation mix that doesn't really work on either level As you'll see, with publishers now often acting merely as the marketing department for whatever developers they've signed, having a prominent and respected name such as EA on a game certainly isn't a guarantee that it will be good.

Superbike World Championship
From Electronic Arts
Tel 800-245-4525 http://www.easports.com
Minimum system requirements 166 MHz Pentium CPU Windows 95/98 32 MB RAM, 4x CD-ROM drive, DirectX 6-compatible sound card 20 4 MB DirectX 6-compatible video card, 144 MB free hard disk space plus space for saved games.
Recommended system requirements As above with 233 MHz Pentium CPU 8x CD-ROM drive 3D graphics accelerator or Direct3D-compatible sound card with 8 MB RAM 402 MB hard disk space
Street price. $65

With last year's Superbike World Champions, publisher Intense Entertainment and developer Interactive Entertainment were able to do what no one else had, namely create a title that explored the simulation (read realistic) side of motorcycle racing Flawed in some areas and limited in terms of available bikes tracks and a truly realistic ride, Superbike World Champions nevertheless took us swiftly from the stereotypical whips, chains and bizarre physics of other more "arcade" games and garnered its fair share of critical praise



It also unwittingly set the stage for what must surely be considered the finest bike racing game, and quite possibly one of the finest racing games of any kind ever to be released That game is the similarly titled Superbike World Championship and it is an absolute must-have for any fan of high-speed action.

Developed by the obviously adept Milestone design house in Milan, Italy, Superbike explores the upper echelon of motorbike racing, and does so in the most realistic and compelling fashion. With 12 real world Superbike courses and an overflowing roster of real riders bikes and sponsors, it sports a truly authentic environment With hauntingly photorealistic graphics that surpass those of Ubi Soft's superb F1 Racing Simulation It is a visual masterstroke And with a demanding and complex physics model, it challenges like no other bike racing game

Superbike World Championship is an absolute must-have for any fan of high-speed action

For motorcycle simulation buffs Superbike is the only way to go How complex and engrossing is the ride? Let me put it this way I spent my first two hours playing this game just trying to carve the perfect lap at Italy's Monza, enjoying every subtle moment and reminiscing fondly back to my earliest experiences with Microprose' Grand Prix II

I soon found that I was indeed astride a tenuous, nervous motorcycle with each experience differing as I moved from Honda to Ducati to Yamaha. If I accelerated too quickly, there was a good chance I'd pop a wheelie and flip, if I braked too suddenly on a downhill slope I'd bring the rear wheel up and potentially take a dive over the handlebars But more importantly, the subtlety was there

Superbike forces an ultra-smooth, unwavering approach and smart racing lines at all times, with the added bonus of the believable crash avoidance techniques and uncanny behavior of the artificially intelligent competition. And, as a rookie incentive, the game features not only a multitude of realism and difficulty options but a separate arcade mode that serves as an excellent starting ground.

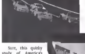
But wait—the best is yet to come Superbike's fabulous technical aspects are further heightened by what must be considered the juiciest graphics this side of a real track. And I don't mean the typical potpourri of 3D effects found in most high-end racing games, though features such as light sourcing, shadowing and tire smoke are generously strewn throughout No Superbike is quite possibly the best looking thing on any number of wheels because it is rendered unlike anything I've ever seen

How can I describe it? I'll just say that it's the closest thing to TV-quality visuals yet manufactured Granted, you have to exceed the recommended system requirements to experience the full glory of the visuals while maintaining a workable frame rate, but it's a knockout show if you do. Heck, it looks good even with the detail turned down—a real plus for those running the game on an older or budget system

Sadly, Superbike has this annoying trait of completely unloading/reloading each track between sessions and even during momentary garage visits, but that's one of its few flaws Otherwise the game simply outclasses all motorcycle and most car racing games too It is truly state-of-the-art.

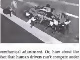
NASCAR Revolution
From Electronic Arts
Tel 800-245-4525, http://www.easports.com
Minimum system requirements: 200 MHz Pentium CPU Windows 95/98 32 MB RAM 8x CD-ROM drive, 3D accelerator card with Direct 3D and/or Glide 3 02 and high-color-capable 1 MB PCI video card with DirectDraw-compatible driver 370 MB hard disk space
Street price $65

On the other hand, we have NASCAR Revolution, a game EA had originally professed would be a cutting-edge simulation As it turns out Revolution is anything but



Sure, this quirky study of America's NASCAR Racing series is filled with some very pretty cars lots of flashy 3D-accelerated effects and a whole bunch of the glossy wrapping that has become an EA Sports trademark. Sure, the circuits are satisfactory depictions of actual NASCAR tracks, with all the appropriate corporate logos, colors, and even individual track textures. And yes, the driving model is pretty fair—for a somewhat less-than realistic arcade game that is.

Its real problems stem from the rough edges that surround just about every facet of the product There's the enormous yet mandatory 370 MB install and the monotonous track loading and unloading procedure that occurs should you venture even momentarily to the garage for a quick mechanical adjustment. Or, how about the fact that human drivers can't compete under their own name Then there's that annoying auto-pilot feature that assumes total control during all pace laps pit stops and caution periods I mean, the idea is to actually drive the thing, isn't it?



Yet the above complaints seem to be nitpicking in comparison to the game's inordinate graphical demands In short even if you meet the recommended system requirements the frame rate will slow to a series of chugging and completely still pictures in the midst of any moderate action Worse still NASCAR's real time gameplay suffers just as much. I found that rounding the relatively short 1 6 km (1 mile) Phoenix oval with a full field of cars took nearly as long as driving the huge 4 km (2 5 mile) Talladega circuit with no cars! Now that is one heck of a serious blow to the rules of virtual racing

Your artificially intelligent opponents, meanwhile, though usually semi-believable and certainly capable of waging their own impressive battles with one another are prone to major errors in judgement and may well be caught plowing right through you like you weren't there A cool pit stop procedure with little crew members who scurry about servicing your car and the very impressive sensation of bouncing suspensions serve to undo some of the damage, but they can't save what seems to be a game released before its time

If nothing else NASCAR Revolution does show just how well Papyrus Design Group had this whole stock car racing thing down years ago with the original NASCAR Racing. Into its third iteration as NASCAR Racing 1999 and now under the Sierra Sports banner it remains the game of choice for a realistic and involving stock car experience ❑

Picky Eater a flavorful treat for youngsters

By Jean Allen-Ikeson

Most young children are already familiar with Arthur, D W's older brother from the popular line of books or the animated TV series If they have a computer in their home, they may also be familiar with these characters from Broderbunds/Living Books other Arthur CD-ROMs Arthur's Teacher's Troubles and Arthur's Computer Adventure. In this latest release, however, it is D W who takes centre stage with a story and activities that surround her picky eating habits

D W the Picky Eater
From Broderbund/Living Books
Tel: 617 761 3000 http://www.broderbund.com
System requirements. Windows, Macintosh
For Ages 3-7
Price. $39 99

As kids' appetites slow around age three or four, the range of foods they'll eat also often declines, much to the chagrin of parents. This disc addresses the problem with humor and a lesson on the consequences of being picky Besides its lively storybook, this disc includes five activities that encourage logic hand-eye coordination, knowledge of food groups and nutrition, reading and writing stories, and word recognition

The story writing feature is perfect for five- and six-year olds. They are given the start of a sentence and offered several endings When they choose an ending, they can match it to an appropriate illustration to create a page Several such pages complete a story that can then be printed out This age group will also enjoy replacing words with picture stickers in the main storybook. This activity includes 30 words/stickers and encourages word recognition. The stickers can also be printed.

An activity that will appeal to three- and four year olds is catching gophers with the computer mouse so D W can chase them out of her garden with the hose Another activity that will appeal to younger children is helping D W decorate and furnish her house The idea is to put the sink in the bathroom, the sofa in the living room, etc. to encourage logical thinking This activity has two levels of difficulty so even the youngest child will not become frustrated. ❑

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TCP

Take note

How to highlight and add comments to text and spreadsheets

By Helen Bradley

This month we'll look at a number of ways to add comments and notes to text in a document or data in a worksheet We'll also discuss how to draw attention to information using the computer equivalent of a highlighter pen and sticky notes And finally we'll look at how some comments can be hidden and how to make others stand out so their message won't be missed

Take out the highlighter

Word 97 has a number of options to draw attention to text. To highlight text as you would on paper with a highlighting pen you need to display the Formatting toolbar and use the Highlight option Select the text, then click the Highlight button to highlight it To use a different color simply click the arrow to the right of the button and select an alternate color from the drop-down list Using a variety of colors you can differentiate selections For example text that needs to be double checked can be highlighted in blue and text that requires authorization or approval can be highlighted in yellow

A comment on comments

Sometimes you'll want to add a comment to a piece of text without it appearing in the text. For example, you may want to ask a co-worker a question about something mentioned in the text or remind yourself of the source of a quote in the text You can do this using the Comment option Select the text you want to comment on choose Insert then Comment

You'll be taken to the Comment area where your initials will appear with a comment number in brackets (e g [HB1]) You can then add your text to the right of this marker Select Close to close the comment area and return to your document. The text the comment is attached to should be highlighted If it isn't, select Tools, Options, View then choose the Screen Tips checkbox and click OK

To view the comment, hold the mouse pointer over the highlighted text and a small box will appear with your name and the comment text. If your initials or name are incorrect, alter them by selecting Tools Options User Information

If you are reviewing a document that contains a number of comments, you can move from one to the next using buttons on the Reviewing toolbar. To display this, select View Toolbars Reviewing, then use the Previous Comment and Next Comment buttons on the toolbar to move from one comment to the next through the document.

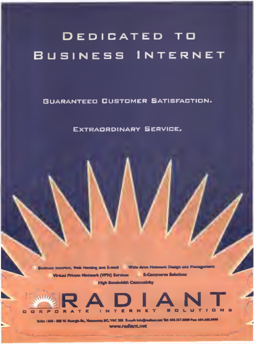
Use the Delete Comment button to delete a comment leaving the text it's attached to intact Right-clicking on a comment and selecting Delete Comment from the shortcut menu does the same thing Selecting Edit Comment from the toolbar or the shortcut menu allows you to alter a comment

To print the comments in a document, select Tools Options select the Print tab and select the Comments checkbox.

Free PC Y2K test

NB—Micro 2000 has announced the availability of a new utility that will tell you if your PC is Y2K ready The machine won't check all of your software but, according to the company, the software test analyzes the ability of a computer's BIOS and Real Time Clock to correctly handle the millennium rollover, as well as leap year issues in the new century For more details, and to download a free copy, check the Micro 2000 Web site

http://www.micro2000 com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When you print the document the author's initials and the comment number print in brackets immediately after the highlighted text and on a separate page the page and comment number are printed with the comment text Comments are particularly useful when you're working on a document with another person They allow you to effectively carry on a "conversation" about the contents of a document behind the scenes

Listen to this!

If you have a microphone and sound card you can record an audio comment in place of writing it Just be aware that sound files are very large so comments need to be short and to the point To record a voice comment select Insert Comment and type a note such as "There is an audio message here" as this will appear in the comment box to alert you or another reader that there's a sound message attached to the comment

Now click the icon that resembles an audio tape on the bar dividing the comment from your document When the sound object dialogue appears, click the Record button (it has a red dot on it) and record your message To stop recording select the Stop button (it has a black square on it) Click the close button on the top right of the dialogue box to shut it down, then click Close to return to your document

When you hold your mouse pointer over the comment you will see the note indicating that there is a sound file embedded. Right-click and select Edit Comment from the shortcut menu and double-click on the sound file to replay the message

Hiding text

Using Hidden text is an alternative to adding comments You might use this to include speaker notes when preparing documents for a presentation. In this case, the text you want to be hidden would be formatted by choosing Format Font, and the Font tab, then selecting the Hidden check box The text will be hidden unless you ask for it to be visible by selecting Tools, Options the View tab, then choosing the Hidden Text checkbox.

Print a copy of the document without the hidden text as you would any other document and print the speaker version with the hidden text by first selecting Tools, Options, then picking the Print tab and choosing the Hidden Text checkbox. The "hidden" text will be underlined with dashes when printed out

Take note!

A small Microsoft add-in called Note-It (which is shipped with some Microsoft products, notably Publisher) allows you to add icons to your documents to which notes can be attached. To use this application select Insert Object pick the Create New tab and browse the list for Microsoft Note-It If it is there click OK. When the Note-It dialogue appears select your choice of image, type a caption for your note and the text to appear when it is selected. To view the note double-click on it and the text will appear in a box at the top of the Word window

You can improve the positioning of the note by selecting it, right-clicking on it, then selecting Format Object Select the Position tab then the Float Over Text checkbox Select the Wrapping tab then None to float the note over the document text Select one of the other options if you would rather have the text wrap around the note You can also simply drag the Note It object onto the margin of the page so it's out of the way

Excel options

Excel has a comment option you can use to add information to a worksheet cell. This can be used to explain the contents of a cell or to make a note about something that needs checking or updating To add a comment to a cell, click the cell and select Insert then Comment. A small yellow box will then appear on the screen with your name in it Type your text into the box (it will scroll if there is not enough room,

➤

Download your files by email

NB—Emailfile is a new service that offers to deliver any file from the Internet to your email box. The idea is simple: you'll always get the fastest response on the link from your PC to your ISP, so by downloading the file by email, you'll save time and avoid bandwidth problems connected with grabbing files from overworked sites. The service is free but the size of files that can be downloaded is limited to 3 MB.

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although you can adjust the size of the comment box before you exit it so all the text will be visible) Click outside the comment box to close it

Excel displays a small red triangle in the top right corner of the cell to indicate it contains a comment Hold your mouse pointer over it to display the comment text. Right-click the cell to display the shortcut menu and you can select Edit Comment to alter the text in the comment Select Delete Comment to remove the comment from the cell The option Show Comment sets the comment so it is permanently visible over the worksheet When the comment is visible like this, you can hide it by right clicking on it and selecting Hide Comment from the shortcut menu

When you're typing text in a comment box, pressing the Tab key selects the comment box (instead of moving the cursor to the next tab stop) If you want a tab character press Control + Tab. You can use the usual options (bold, italic, font size, etc) to format the text so a comment. As in Word 97, if your name appears incorrectly in a comment, select Tools, Options, pick the General tab and alter User Name as required

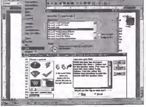
If the comment markers don't appear on the worksheet or if the comments themselves can't be hidden, you will need to set the comments options by selecting Tools Options, View, then pick the Comment Indicator Only button to display the indicator in the cell (the shortcut menu options outlined above will then appear when you right click on the comment)

To print the comments, select File, Page Setup, then pick the Sheet tab and from the Comments drop-down list, choose At End of Sheet to print the comments at the bottom of the worksheet, or As Displayed on Sheet to print any comments as they are displayed (hidden comments won't print)

Selecting View, then Comments displays the Reviewing toolbar (similar to Word's Reviewing toolbar) from which you can select the Next Comment and Previous Comment buttons to move through the comments in the worksheet Use the Edit Comment and Delete Comment options, or the Show/Hide All Comments button to toggle between displaying and hiding the comments

If you have the Note-It add in you can create a Note-It object in the same way you would create one in Word (select Insert, Object, and Microsoft Note-It) To add a sound message to a file use Insert Object, Wave Sound and click OK Record the sound using the Record and Stop buttons, then close the window to embed the sound in the worksheet file Once it is embedded, an icon in the shape of a speaker will appear Click on it once to alter its position on the worksheet, or double-click on it to play the message

You can hide a column in an Excel worksheet by highlighting the column and selecting Format, Column, and Hide You can do the same with a selected row or rows by selecting Format, Row, and Hide.

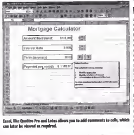


Note-It, which ships with some Microsoft applications, provides a visual way of adding notes to a Word document.

Quattro Pro 8

Quattro Pro has a comment function similar to Excel's. Choose the cell and select Insert, Comments and type your note in the small speech balloon that appears. Clicking outside the balloon makes it disappear and a small red triangle across the top right corner of the cell indicates that it contains a comment Hold your cursor over the indicator to view the comment

Hide a column or a row by selecting it, then right-click and select Hide from the shortcut menu. You can insert a sound object in a Quattro Pro worksheet exactly the same way you do in Excel (use Insert, Object)



Excel, like Quattro Pro and Lotus allows you to add comments to cells, which can later be viewed as required.

WordPerfect 8

Insert a comment into a WordPerfect document using Insert, Comment. When you do this, the screen clears and you can add your text into the comment area and choose from a number of options for inserting the date and time and your name into the comment Click the Close button to return to your document The comment Indicator will appear in the left margin of the page. If you can't see it, use View, Zoom, Page width, then OK.

WordPerfect has a highlighting tool on the WordPerfect 8 toolbar To display it, select View Toolbars, WordPerfect 8 then OK.

Lotus 1-2-3

To add a comment to a Lotus worksheet cell select the cell, then pick Range, Cell Comment and type the comment into the dialogue. Select the Name and Date Stamp button to add your name and the date to the comment, then close the dialogue to return to the worksheet. A small red dot in the top left corner of the cell indicates that it contains a comment. Unfortunately Lotus doesn't make it easy to view comments. You will only see them if you select the cell then the Comment tab with the Range Properties dialogue open.

Word Pro 8

Add a comment to a WordPro document using Create, and Comment Note. Type the text for your note and click the close button to return to your document. You can manage comments and highlights by displaying the Review & Comment Tools SmartIcon bar (select View, Show/Hide Review & Comment Tools) There are icons for highlighting text and viewing and hiding comments. ❑

Next month we take a look at how to adjust a word processing document to make it fit the page better We will also give you a number of options to reduce or increase the length of a document. Helen Bradley can be contacted at helen@journalist.com

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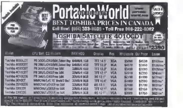
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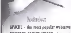

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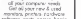

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USER GROUPS

ATTENTION USER GROUPS: Send in your listing (maximum 120 characters) for the May issue by Friday April 30. User Group submissions run for one month only in the local edition. The Computer Paper reserves the right not to print submissions which are deemed unsuitable.

ACM/SIGGRAPH Computer Graphics. 2nd Tuesday, at 420 Homer St. Call Tom Berryhill at 734-2076.

ALT.2600 VANCOUVER USER GROUP. Meetings are 1st Friday of each month at Pacific Center Mall by payphones in food court, north of Dunsmuir at Granville 4pm to 9pm. Starts early to catch the evening shift 2600ers. For more information contact Steve via email at <sage@vanbc.wimsey.com> or <sage@rainbow.deeken.com>

AMIGA USER GROUP (Panorama) For meeting times and place call Ray Norman 589-7196 or Robert Hardy 942-6364. BBS numbers 270-4561

APPLES B.C. COMPUTER SOCIETY A User Group for Macintosh and Apple IIc. Macintosh meetings are on 3rd Wednesday of each month at the York House School in Vancouver at 7 p.m. Novice and other special-interest groups are held mid-month. Apple II meetings are on 1st Monday of each month at 7 p.m. at the Century House in New Westminster. For further information call 437-9005 or 290-5597.

ATARI USERS1 Vanton/Vancouver: BC V6S 3Y6, 8th Sutherland 988-1450; Don Hatch 438-8066, 2357 Western Avenue, N.Van B.C. V7M 2L4.

EDI USER GROUP For more information call 538-8264 (preferred), to meet email 538-8219.

B.C. VAX/VMS Local Users Group (BCVAXLUG) provides a forum for the professional growth and education of its members through the exchange of solutions, ideas, and opinions. User group meetings are held the 3rd Wednesday of every month at 6:30 p.m with location to be advised. For further info please call voicemail 276-6068.

CANADIAN INTERGRAPH USERS GROUP CONFERENCE September 8-11 1998 Delta Meadowvale, Mississauga, ON. "Drive The Open Road" Contact: Laura Banman Intergraph, 2912 Memorial Dr. SE, Calgary AB T2A 7R9. Voice (403) 569-5662 Fax (403) 569-5801 e-mail: lbanman@ingr.com

CIPS VANCOUVER SECTION. (Canada's largest Association for Computer Professionals). CIPS Members bring unparalleled networking and professional development opportunities at our monthly meetings and official events. Discounts offered for student members. PO Box 20622, Howe St. Vancouver, BC V6Z 2N8. Phone (604) 481-2798 or Fax (604) 598-1879 for next meeting date.

FOXSOFT EDMONTON'S FOXPRO USERS GROUP-second Tuesday 7:00 pm Grant MacEwan City Centre Campus East Wing, Room C-137/C-136, 10700-104th Ave. Contact: Ken Rayner at 437-0315 or Robin Stuart at 469-3712 (days) Info Bulletins on 666 467-4186.

INDEPENDENT COMPUTER CONSULTANTS ASSOCIATION OF BC The ICCA is a non-profit association of consultants who provide services in the field of Information Technology. The objectives of the ICCA are to provide a forum where consultants can network with each other, exchange ideas and improve their business and computer skills. Monthly meetings with speakers. For further information contact us at: PO Box 000, Bentall Station, Vancouver BC V6C 2N6 tel: 683-2747 fax: 681-3010 email: icca@mindlink.bc.ca / www: http://www.lotus-bc.org/icca/

LOTUS NOTES. see "Pacific Notes User Group"

MACWEST COMPUTER SOCIETY Meetings for interested and visitors include PD copy sessions. General meetings: 2nd Wednesday of each month; Beginner's meetings: 3rd Wednesday of each month, 7:30 p.m. at Surrey Conference Centre. For messages and information call 266-9630.

MS ACCESS TECHNICAL USER'S GROUP For those who want to participate in learning more about MS Access. For information call Greg Hind at 464-0262, from 9:00 to 5:00.

OBJECTS USER SOCIETY See British Columbia OpenStep Group (B.C.O.G.).

OPENSTEP USER SOCIETY (VMUG) See British Columbia OpenStep Group (B.C.O.G.).

PACIFIC NOTES USER GROUP (PACNUG) Lotus Notes users meet the last Wednesday of each month, 5:15pm at Notes on Robson on July 31st. Contact Delores Stone at 988-2741 or dstone-b@nevada.com

PC/MAC USER GROUP Wanted Professional Photography/Graphic Designers to share, network and learn the Web hardware and software programs available. Starting May 7th we will meet at 7:00pm every 1st and 3rd Tuesday of the month, at Tosme Computer Center, #203-1826 W 5th Ave. If you are interested please contact: B. Harrington at either 873-8815 or caoto@mindlink.bc.ca for further info.

PORT COQUITLAM COMPUTER CLUB. Commodore, Amiga & IBM 1st & 3rd Tuesday 7:30 p.m., Room 104, George Pearkes Jr Sec School, 1300 Laurier Ave., Port Coquitlam. For further information contact: Ed Dyer at 942-8884.

POWER BUILDER User group being formed. Meetings are planned for first Wednesday. To enrol call Perform System Developers at voice mail 604-264-8847

SQL SERVER User group being formed. Meetings are planned for first Monday. To enroll call Perform System Developers at voice mail 604-264-8847

TI 99/4A COMPUTER B.C. User Users Group every Thursday 7:10 p.m. For information call Ron: 522-2598. 1st Thursday Tutorials, 2nd Thursday General, 3rd Thursday Tutorials, 4th Thursday Library night. BBS "Dial A TI" 522-9630 TI only please.

TEENS IN VANCOUVER USER GROUP For teens under the age of 18 interested in doing computer related projects regularly. WWW, programming, games, anything. The main goal is to share computer knowledge and to make friends. If there are any homeschoolers interested that would be great. If interested, please call Orion Mak at 326-3835.

VANCOUVER AUTOCAD USERS SOCIETY 4th Wed. of the month, 7:30 p.m. B.C.I.T Bby Campus Bldg. SW5 Room 1908. Contact: Frank Zaiahn (604) 542-5886

VANCOUVER DELPHI DEVELOPERS ASSOCIATION meets once a month at the Liquor Distribution Branch located at 3200 East Broadway. The purpose of the group is to provide a common and regular forum for Delphi Developers to get together and discuss Delphi related issues. All meeting notices are sent via email and can also be seen by visiting our website at http://www.infocan.com/VDGA.htm. To add your name to our distribution list, please forward your company name, address info, phone, fax and email to vdda@infocan.com or fax 736-5866 tel 736-5888

VANCOUVER FOXPRO USER GROUP (VFUG). September-June, 2nd Tuesday at 1900 hours, 500-1177 W. Broadway. Info call Chris at 736-2882, 666 231-9998 and e-mail to pcytan@unixserve.com

VANCOUVER GEOWORKS USERS CLUB. For further info, please call 683-7885 (eves)

VANCOUVER GEOGRAPHIC INFORMATION SYSTEMS USER GROUP Meetings are held on the 4th Wednesday of each month September through May at B.C.I.T. Town Square Room 'C' at 7:30pm. Contact Dwight at 940-1518 for information.

VANCOUVER KAYPRO USERS GROUP-VANCOUVER PORTABLE COMPUTER CLUB (VPCC), AMO 17, Jay Sieget, 4207 Lancelot Dr, Richmond, B.C., V7C 4S4 271-1519 666 271-0804

VANCOUVER MACINTOSH USER GROUP (VMUG). Vancouver's newest Macintosh Users Group serves Mac users in the Vancouver North Shore and Burnaby areas. Everyone is welcome, regardless of experience. Visit our Web Site at http://www.vancouver.net/vmug and join online or call 688-8088 or email slang@direct.ca for more info.

VANCOUVER NETWARE USERS GROUP (VNUG) is an official user group recognized by the Netware Users International Assoc. and supported, in part, by Novell. Meetings are held on the third Wednesday of every month at 7 pm at PBGC Computer Training Centre Hong Kong Bank building 900-836 West Georgia Street. All aspects of the networking environment are discussed and presented with emphasis on the Netware network operating system. The workshop begins at 4:00p.m., buffet dinner at 6:00pm; at 7:00pm is a Q&A session followed by a presentation ending at around 8:30pm. Member, non-member and student pricing applies to the workshop and/or dinner-presentation. For further information or meeting topic announcements call our voice mail at 688-VNUG (688-8684) or Fax us at 689-8656.

VANCOUVER PC USERS SOCIETY (VPCUS). 2nd Thursday 7pm at the Pacific Space Centre (the Vancouver Planetarium) members free and guests $5 admission. Excellent Q&A session & feature presentation. Our mission is to educate and inform our members and the general public on the current and future issues in personal computing and to provide a social context for the business, educational and personal use of microcomputers. We offer an disk newsletter, educational seminars, special interest groups (see separate VPCUS SIG listings), and more. Call 298-9696 for details and schedule.

THE VANCOUVER SQL Server Users Group is an independent non-profit organization dedicated to providing an information exchange about Microsoft SQL Server. Launching its bi-monthly meetings starting Thursday January 7 1999 from 6:30pm to 8:30pm. For more information, call our web site at www.vansql.org. Phone: 899-9434

VPCUS CLARION TOPSPEED SIG — Clarion is a full-featured, industrial-strength DOS & Windows application development tool. Its superior high level language and re-usable templates produce compatible code and tight EXE's that run fast and are royalty free. This lively SIG attracts a range of participants from seasoned professional programmers to end users and the curious. Room the 1st Wednesday of every month in Metrotown. Contact John Grille, 736-7782.

VPCUS DBUG (Data base Users Group) Emphasis is on solving problems of data management with special reference to Paradox. Bring a blank 3.5 inch disk to pick up goodies from the meeting. Meetings for the next few months will be informal, and held at a local pub. Contact Brad Froese, 987-7222, or email: bfroese@...

VPCUS Educational Seminars — Members $5, Non-members $15. Various Rooms times and dates. Contact Gwenda Ellwood, 737-8874.

VPCUS HTML AUTHORING SIG The SIG is a good place to come for informal discussions with most HTML developers or to get advice on building business and personal Web pages. Topics include graphics and HTML, plug-ins, the browser wars, Java, connectivity issues and marketing on the Internet. Both novice and advanced HTML authors are welcome. We meet on the 2nd Tuesday of each month. Contact: Brenda Delaney: bdelaney@interchange.ubc.ca or at Virginia Green: virginia@unixg.ubc.ca for meeting info and to get our email list.

VPCUS INTERNET SIG New to the Info Highway? Get to know the internet and the Web with an experienced player. Contact Joe Thompson for details, 685-0945.

VPCUS WordPerfect SIG-Participants share tips and troubleshooting for all versions of WordPerfect for Windows and DOS. Contact Holly Rivers at 731-9634, or email: hollyr@dowco.com

VPCUS NETWORKING SIG This is the place if you are a network administrator and you want a break from beating your head against a wall or want to relate with people who actually care what you are talking about. Come and share tips, tricks and support ideas. Currently on Room; we're looking for volunteers interested in getting the SIG going again. Contact Brenda Delaney bdelaney@interchange.ubc.ca or call 224-2140 for more information.

VANCOUVER LINUX USER GROUP- A group of students, professionals and interested enthusiasts with a common interest in Linux, UNIX and Open Systems. Linux is a free yet very powerful operating system for personal computers of all types. Anyone interested is welcome to join VanLUG. For membership information, please visit the Linux in Vancouver Web Site (http://www.vancouver-webpages.com/vanlug/), or send messages to: info@linux.bc.ca

VANCOUVER OS/2 USER GROUP Attended by OS/2 gurus and novices alike. The large and lively meeting is held on the first Wednesday of each month at the BC Tel Building, 3777 Kingsway Burnaby and starts at 6:45 pm. Contact Jim Shearhuk 876-4780.

CALENDAR

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3rd Annual Business Computer Convergence99 to be held in Calgary on May 12 & 13 1999. The event will be held at the Calgary Convention Centre from 9 am to 4:30 pm. For more information on Convergence 99 and other IT and AT conferences visit www.convergence99.com or contact Ron Schoerkogel, Seminars Shows & Solutions, 1027 Prospect Avenue SW Calgary, Alberta T2T 0W9 or Phone (403) 244 1996 fax (403) 244 4313. Email computer@convergence99.com

COMPUTER SWAP MEET Saturday May 1 1999 from 11am to 4pm at the Capital Hill Community Centre, 361 South Howard, North Burnaby. Admission $2.00. For more information call (604) 521-6364

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The eight annual newMedia Conference and Tradeshow from June 1 - 4, 1999 at Metropolitan Toronto Convention Centre, 255 Front Street West Toronto ON

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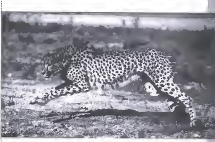

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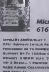

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On TV, the image jitters colors smudge detail is lost, and the sound quality is generally poor. In the near future, however digital video will bring more of that "theatre-quality" to your home television and personal computer screens. In fact, if you want a really good taste of the future of digital video now, it's as simple as signing on to one of the two legal Canadian Direct to Home (DTH) satellite TV services, shuffling off to Buffalo (or other cross-border venues) for a black market U.S satellite service, or playing a DVD movie on a compatible PC. The traditional television providers, the broadcasters and cable companies, are scrambling to catch up with the challenge from space, and from the computer.

Why 'good enough' isn't good enough anymore

For halt a century, Canadians were pretty passive consumers of television. We accepted whatever quality of television (in terms of both content, and image and sound fidelity) that a few broadcast networks offered, happy to get a wide variety of entertainment and news for "free," in exchange for watching a certain amount of pesky advertising. With the advent of the VCR, cable TV and dozens of specialty channels, we were persuaded to pay money to watch television (though we still had to pay in time spent by watching commercials). We assumed that video was limited to a certain low level of picture clarity and detail, much inferior to what we could expect in a movie theatre.

The PC began to challenge traditional notions of video in the late 1980s when the Commodore Amiga gave birth to desktop video, and the Mac similarly kick-started CD-ROM-based multimedia. The early digital video playback formats for personal computers weeen't very good in those early days, however postage stamp-sized QuickTime or AVI format movies, or grainy, jerky MPEG-1 CD-ROMs failed to offer a real alternative even to the rather lousy, venerable NTSC (National Television Standards Committee) video standard.

In practice, we continued to accept a flickering, 200-line video standard because that was ... well, the standard. Small numbers of Beta video, laser disk and S-VHS users could point to the existence of other, superior video technology, but those alternatives remained niche markets, not the mainstream.

DVD daze

Then, in the mid '90s, we began to hear about something called DVD (digital versatile disc) DVD offered enough space on a single CD-sized disc to store a feature film in high resolution, high quality MPEG-2 format. MPEG 2 video offers many times the resolution of regular broadcast TV or VHS tape, and much crisper image quality and color definition.

As the CPU and graphics chips in PCs have recently become fast enough to decode and display full screen, full speed MPEG-2 digital video on a PC, it has become obvious that the future of better quality video is digital. At the same time, there has been an expensive, controversial initiative—mainly from Americans and Japanese—to develop an even higher resolution HDTV (High Definition Television) format, with up to 1 080 vertical lines of resolution, and 1,600 pixels of horizontal resolution. This results in video that looks more like a motion picture projected from film in a theatre than regular NTSC video.

The difficulty of being digital

The biggest obstacle to better quality television is no longer a lack of better technology. Rather, it is the weight of 50 years of NTSC video history, or perhaps more accurately the weight of the hundreds of millions of NTSC-compatible TV sets and video cassette machines currently in use.

To move to high resolution digital video the whole video universe from the installed base of television sets, through video production facilities, broadcasting stations, cable networks, to video rental stores, has to be rebuilt. This will take many years and billions of dollars. In the short term, the best way around the old-style dinosaur of television is to subscribe to a direct-to-home satellite service, or to get a DVD player, either a standalone unit or a DVD drive in a PC.

The foot in the door

Just as video game consoles and banking machines helped people become familiar with computer technology, so satellite TV and DVD are selling the benefits of digital video to the mass audience.

Typically, a direct-to-home satellite channel beams a very good quality MPEG-2 format video stream to earth, where it is picked up by a subscriber's satellite dish. The signal moves over a short cable to a set-top box that decodes the MPEG-2 signal and sends it by another cable to a TV set where it is displayed to the viewer. Since almost nobody (yet) has an all-digital TV set in their home, the MPEG-2 video is converted back to NTSC format for display on an analogue TV. However, the converted signal is still of a far higher quality than that coming from current VHS tapes or cable feeds.

As with users of cable modem or ADSL Internet services, once consumers have tried a superior video technology, they don't want to go back to the old way. As a result, almost 600,000 Canadian households have signed up for satellite TV service, and several hundred thousand more are using illegal U.S. services. (It's interesting to note that while the Canadian government has basically given up trying to regulate international content on the Internet for Canadians, it still believes Canadians shouldn't be allowed to receive unauthorized signals from satellites orbiting the earth.)

The Canadian government has opened the gate for digital video broadcasting in this country, and the cable companies will roll out digital cable services in different regions in 1999.

Sales of DVD players in Canada, which essentially started in 1997 and numbered 28,000 units that year, increased to about 65,000 in 1998, and are expected to top 120,000 in 1999. Compared to about 1 4 million VCRs sold in the average year, digital video in all its forms has a way to go. However, over the next several years, PCs, the Internet, satellites, and digital video monitor technology will combine to make the TV we watch today look like flickerings on a cave wall from some bygone era. ❑

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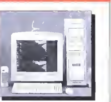

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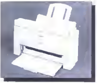

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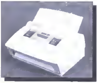
HP 695C, 600 x 600 dpi	$259
Epson Stylus 640, 1440 x 720 dpi	$289
Lexmark 3200 1200 x 1200 dpi	$299



Laser Printers

Brother 1020 (600 dpi, 10ppm)	$439
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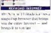

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